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The routines and rituals of a design and technology classroom: An ethnographic study

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**The Routines and Rituals of a Design and Technology
Classroom: An Ethnographic Study.**

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Abstract

This research examines questions and issues raised from an ethnographic study of a secondary design and technology classroom. A critical ethnographic methodology was employed to explore the 'way of life' in design and technology and examine how aspects of this micro-culture impact on teaching and learning.

This ethnographic account includes description and discussion of four significant aspects of design and technology culture. The first examines the predominant masculine culture within this classroom and the subject area at large. The second is the story of four girls and their perceived alienation and exclusion from the dominance of "a boy subject". Third is an account of both internal and external perceptions of the status of design and technology compared to the more traditionally liberal pursuits. The final point is an analysis of how aspects of the culture within this classroom impact teaching and learning. The implications of aspects of this classroom culture are discussed.

Declaration

I certify that this thesis does not, to the best of my knowledge and belief:

- (i) incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;
- (ii) contain any material previously published or written by another person except where due reference is made in the text; or
- (iii) contain any defamatory material.

Signature

Date

17/08/1999

Acknowledgments

My work is dedicated to the two most important and wonderful people in my world;
my wife Kylie and our son Harrison.



For those whom have helped me throughout this journey, I am truly grateful. To the Staff and Students of Seaside (pseudonym) Senior High School, this study would not have been possible without your participation. Special thanks to Mr Pritchard who was open, honest and genuinely interested in contributing to an understanding of our area of learning. Many thanks to my supervisor Dr P John Williams whose door was always open. Finally, thanks to all the staff and students at ECU who make the process of knowing worthwhile.



Contents

<i>Context: Past Present and Future</i>	7
<i>Concepts for Examining Culture</i>	11
A Critical Perspective	11
Symbolic Interactionism: Layers of Reality	13
Defining Culture	15
Thick Description	19
Educational Ethnography	21
<i>Towards the Goal: Methods</i>	23
Building an adequate view: Progressive focussing	24
Participants	28
In the field	28
<i>A Limited Perspective</i>	32
<i>An Introduction</i>	35
<i>The Home of Shed Men: Masculine identities</i>	38
Male artefacts	39
The environment	41
Conception of technology	45
<i>Strangers: The four girls</i>	47
Technological competence	47
Strategies for survival	49
Extraneous influences	52
<i>The order of merit: Our place</i>	56
Location	56
Internal perceptions of design and technology	59
External perceptions of design and technology	62
<i>The Apprentice Master</i>	65
<i>Implications</i>	71
Challenging identities	72
Restricting right of passage	74
The paradox of status	75
Challenging the order of knowing	77
<i>Summary</i>	79
<i>References</i>	83

Context: Past Present and Future

The instructions to make my way to the design and technology department were complex. They involved a long walk from the front car park, down the side of the school, past the bus shed, the gardener's shed and through a large gate where I would find some tall industrial roller doors. This was the design and technology department. It is an easily recognisable area of most schools, nearly always down the back with an extraction hopper that towers above the school roof. The scene was reminiscent of a snapshot from the industrial revolution. Productive looking rows of machinery, a tangle of extraction tubing, walls adorned with artefacts of a bygone era and the overuse of a dull industrial green favoured by industries of the sixties dominating the room. In terms of the school ecology, this appeared a fascinating and forgotten place. These workshops showed little signs of the dramatic changes that have been taking place within education and in particular, design and technology. There was little evidence of the dawning of a new millennium whilst rich examples of a culture preserved through history remained prominent.

The emergence of technical education, as a formal conception, dates back to the transition from a father-son mentor relationship to the establishment of formal apprenticeships in Egyptian, Greek and Roman times (Gradwell, 1996, p.246). During the time of the Industrial Revolution, educators provided a rationale for teaching practical arts subjects as part of a general education. Early theorists such as Froebel and Montessori (cited in Gradwell, 1996, p.246) promoted the idea of the child as an active participant in the learning process and handiwork as a means of formative education for all students. Despite this generalist approach, the technology

education agenda was eclipsed by the economic and social demands for vocational training. The genesis of technology education can be characterised as catering to the economic needs of the nation and providing mostly men with the knowledge and skills necessary to compete in the new industrial world. Largely anti-intellectualist, it catered for non-academic students or what was coined as the “new fifty percent” that resulted from compulsory education in the 1930’s (Herschbach, 1996, p.28).

To some extent design and technology remains hostage to its origins, despite the search for a new identity and direction. Deficiencies in the existing curricula have been identified and the challenge for a redefinition of technology has international if not universal support (Walsh, 1993., Gradwell, 1996., & Herschbach, 1996). Such redefinition has been identified as involving: the upgrading of status, the abolishment of its gender specificity, the broadening of conceptions of technology and opportunities for problem solving through reductions in teacher centred approaches (Williams, 1996, p.18-19).

Design and Technology and its emerging redefinition are relatively new to this country. Its emergence as a major subject area follows international recognition of the growing relevance of technological education for society (Walsh, 1993, p.160). While not preceded by any single well-established discipline, design and technology has developed from a number of technologically based disciplines. Whilst possessing characteristics that are distinctly different from its predecessor, industrial/manual arts, its genesis exists in this area. In fact, for many schools, design and technology is simply a name change resulting from an edict of the Education Department.

There is, at present, a great diversity in the approaches to design and technology education within schools. Its historical origins continue to influence these approaches with many schools maintaining a significant connection with this history. Some schools have followed international trends and embraced changes whilst most schools are somewhere in the process of coming to terms with such a dramatic redefinition. In this country, changes being implemented are still in their infancy and, as such, many schools are still aligned with the traditional approaches of industrial arts. A climate of uncertain change dominates this subject area. Staff are divided on the benefits of proposed changes and the power of its dominant history is a significant factor in this debate

Change will feature heavily in the future of design and technology education. As a dynamic element in society, technology and its constant adaptations will necessitate flexibility of curriculum. The trend is towards a focus on the outcomes rather than inputs of education with the processes of technology a central theme to curriculum direction. The move is away from technology education as an elective, generally selected by boys as a precursor to a trade career, to an important and compulsory aspect of general education. A consistent factor in the evolution of technology education is the impact of economic and political factors on educational policy. Just as it shaped early conceptions of technical training, so may we expect continuing involvement of these factors in the redefinition of design and technology.

There is much to know and understand of the features and characteristics of this subject area. The international trend towards design and technology is quite recent

and, as such, the accumulated body of knowledge within the field is relatively small. Those who practise within this field have primarily been interested in developing the skills and expertise associated with the design and production of artefacts. Little attention has been given to researching the cultural and social characteristics of this subject area. As a result of this little is known about the many phenomena that exist within the classroom, its features and characteristics, the culture that dictates the rituals and routines and the way in which teaching and learning takes place.

The unique culture of this subject area is somewhat magnified in relation to the current climate of change and the various responses to these changes. It was these unique characteristics that were the impetus for this study. The rows of machinery, the annexed location, a line of student crafted medieval looking battle axes and a poster of a naked buxom blonde on the back of the staff toilet door; they were all interesting cultural facets of this subject area and considered worthy of further investigation.

The intention of this study is to investigate this culture, to examine the features and characteristics and the routines and rituals that define this subject area. In conducting this study it is hoped that a clearer understanding of the culture of a design and technology classroom will be established, an understanding of the many contributing factors that influence this culture and the implications that this culture has in the classroom. The aim is to know and understand a little of the way of life in design and technology.

Concepts for Examining Culture

Ethnography literally means a *picture* of the 'way of life' of some identifiable group of people (Wolcott, 1988, p.186). The aim of this study is to explore this notion of the 'way of life', to understand and know a little more of the features and characteristics that define a design and technology classroom. As both a research methodology and the product of that research, ethnography is aligned with a sense of what this study hopes to achieve.

In his travel writings, Kaplan (1997) makes the point that no two travellers interpret the same people and environment in the same way. A picture or photograph (even of 'the way of life') is produced from different angles and different perspectives; different audiences view it in different ways. Concepts discussed in this section are those that orient this research in response to these differences. They are the perspectives or angles that guide this journey and are derived from an established body of knowledge in the area of anthropology and education.

A Critical Perspective

Ethnographic presence is a term used by Fetterman (1989, p.116) to describe the involvement and position taken by the researcher in both the field and the text. As an emerging discipline within education, ethnography has developed what Spindler (1982, p.3) describes as distinct and eclectic approaches. Analysis of these various approaches necessitates confronting the partiality that the researcher lends to the account. As Bruner (cited in Gray, 1996, p.30) states, a qualitative researcher is not

an objective authoritative politically neutral observer standing outside and above the text, they are an all too-human observer of the human condition.

The field disciplines of anthropology, sociology and psychology have traditionally been aligned with conventional ethnographic work. In recent times the influences of postmodernism and poststructuralism have generated a substantial body of work in critical ethnography. There are elements of this study that characterise it as a critical ethnography. Agar (1996, p.26) views critical ethnography as looking at the local context and meaning, as traditional ethnography does, but then confronting *why* things exist and occur as they do.

"What power, what interests, wrap this local world so tight that it feels like the natural order of things to its inhabitants? Are those inhabitants even aware of those interests, aware that they have alternatives?" (Agar, 1996, p.26).

The element that defines it as critical, some refer to as intrusive analysis or the urge to go beyond the 'what is' to the 'what ought to be' (Wolcott, 1990, p.29). Both the conventional and critical paradigms are not as easily constrained within the descriptive versus prescriptive argument that some purport. Critical does not necessarily imply, as Wolcott (1990, p.29) suggests, a shift from researcher to political activist. It does, as Thomas (1993, p.4) states, involve a reflective process of choosing between conceptual alternatives and making value laden judgements of meaning and method to challenge research. For Agar (1996, p.26) it is about 'choices', unfolding possible choices that participants may not even know they have.

Within this critical approach, the orienting framework of the ethnographer operates within the dialogue created (Carspecken and Appie, 1992, p.512). A key element in distinguishing between critical and conventional ethnography is the presence of the researcher or the dialogue between the researcher and the researched. This balance between the emic and etic perspective or insider and outsider points of view is a distinguishing aspect of critical approaches to ethnography. A critical ethnography is constructed, to some extent, in terms of the ethnographer's own professional context and goals. For Agar (1996, p.239) it is difficult to imagine any ethnographic account that is not a blend of these perspectives.

Critical ethnography moves through the conventions of descriptive ethnographic methodology to asking 'what could be'. A critical approach is embedded *within* conventional ethnography. As a consequence of this, critical and conventional ethnographers share several fundamental characteristics. Among these are what Thomas (1993, p.3) identifies as a reliance on qualitative interpretation of data, core rules of ethnographic methods and analysis, adherence to a symbolic interactionist paradigm, and a preference for developing grounded theory, all of which will be discussed in the following sections.

Symbolic Interactionism: Layers of Reality

A significant characteristic of ethnography is that meanings are plural and open, participants construct their own meanings, and reality is constructed through our interaction with society. The theoretical foundation for these considerations is

symbolic interactionism, a paradigm through which the complex layers of human experience can be unveiled through focussing on the way interaction among people is shaped through the meanings and expectations that they bring to the setting.

"They [symbolic interactionist's] studied patterns of communication, symbols and signs. This approach viewed reality as a social construction; because it questioned conventional "scientific" notions of the nature of reality, it called into question common assumptions about the validity of schooling outcomes" (LeCompte and Preissle, 1992, p.850).

Blumer (cited in Woods, 1992, p.338) proposed three central principles of symbolic interactionism. The first is that human beings act towards things on the basis of the meanings that the things have for them; secondly, that this attribution of meaning to objects through symbols is a continuous process and finally, meaning attribution is a product of social interaction in human society. As a framework for making sense of the social world, symbolic interactionism accounts for the complexities of human understandings and interactions.

The implication for this study is that inquiry, framed in some way by symbolic interactionism, is grounded in the day to day social life of the participants.

Understanding is developed as participants interact together, develop understandings and meanings, engage in joint action, and respond to each other as they adapt to situations (Woods, 1992, 348). As a framework it guides ethnography as it attempts to understand and interpret what the behaviour means to the person or group being studied (Wiersma, 1995, p.250). This perspective compels recognition and

acceptance of multiple realities, which is crucial to understanding why people think and act in different ways (Fetterman 1989, p.30).

As a fundamental theoretical paradigm, symbolic interactionism necessitates defining of meanings from the perspective of participants. In terms of a critical approach to ethnography, it moves beyond this agenda to expose the sources of inequality in society and how they are produced and reinforced within schools (LeCompte and Preissle, 1992, p.852). In conventional ethnography, symbolic interactionism is the primary theoretical paradigm through which the world of the classroom is understood. Critical ethnography however, borrows from theories of conflict, critical and emancipatory theories. In terms of this study, symbolic interactionism provides explanation for the complexities and diversity of human experience. It accounts for the numerous ways in which meanings are developed and how participants make sense of their experiences.

Defining Culture

At the heart of ethnography is the elusive and problematic concept of culture. It is what Fetterman (1989, p.27) describes as the broadest ethnographic concept. Despite a universal acknowledgment that culture is central to the business of ethnography, there is a continuing dialogue (Wolcott, 1991; Spindler, 1991) concerned with clarifying its position in relation to ethnographic methodology. Clarifying or moving towards defining culture is a significant element of an ethnographic study. The purpose of the study is to seek out aspects of the way of life in a design and

technology classroom that can be attributed to culture. For this reason establishing an operational definition of culture becomes relevant.

Wolcott (1988, p.186) refers to culture as "an undifferentiated and diffuse variable".

He contends that culture is always an abstraction, regardless of whether one is referring to culture in general or to the culture of a specific social group. Fetterman (1989, p.27) considers any definition of culture as espousing an ideological or philosophical perspective. Despite culture's reticence to definition, there are some useful contributions that clarify the position and understanding of culture in terms of this study.

Agar (1996, pp.238-239) approaches the concepts of culture and ethnography through their interrelationship with each other. He contends that through establishing the pieces and relationships of culture and making these explicit, we can develop a theory of culture. It is this theory that notes what pieces and relationships must be present and specifies those that may be present in some places and not in others. Ethnographic methodology fits into Agar's framework as the process that connects all these pieces and relationships together to provide an account of the culture under investigation. A significant aspect of this framework is the concepts of macro and micro culture. In developing an account of the specific, aspects of the whole or macro culture are drawn upon to account for the specific micro culture under investigation.

The concept of macro and micro cultural systems interacting is a significant contribution to the ethnography and understanding of a classroom. As a cultural entity, the behaviours within a design and technology classroom take place against a backdrop of what it means to be both a teacher and a student within that setting. Factors influencing these perceptions include the premises, interests, values and various positions on what constitutes worthwhile knowledge and learning. Burns (1995, p.246) stresses it is inevitable that these perceptions will be shaped within the larger social, cultural and political contexts. The classroom never stands in isolation from the larger cultural and social landscapes.

The implications of the interplay between the classroom and the broader context for this study is that, as a researcher, there is a profound awareness of the complexity of human behaviour and human experiences within a particular setting. Fehring (1986, p.31) considers the explication of the dynamic interplay among elements in the physical, natural and socio-cultural environments as crucial to understanding and explaining what people do and how and why people react the way they do.

Agar's framework provides a foundation for understanding that culture may consist of various pieces and relationships, although these are not defined clearly within this framework. The concepts of pieces and relationships, used by Agar (1996, p.238) are relatively vague in terms of defining culture, whilst Goodenough's definition (cited in Wolcott, 1988, p.187) provides a less abstract definition of culture.

"The culture of any society is made up of the concepts, beliefs and principles of action and organisation that could be successfully attributed to the members of that society in the context of his [sic] dealings with them"

Wolcott (1988, p.187) contends that all human beings are occupied with trying to discern and to act appropriately within the framework of the macro and micro cultural systems in which they operate as members of particular societies. Not only do students and teachers figure out and become competent in the macro culture of which they are a part but they also, as Wolcott (1988, p.187) states, function in numerous micro cultural systems. The design and technology classroom is one such micro cultural system that both students and teachers operate in, and develop competency with. There are features and characteristics, values, beliefs, routines, rituals and principles of action and organisation that define this micro culture. Indeed it is these attributes which constitute the pieces and relationships that Agar (1996) suggests. Discerning the various components of a culture and their interrelationships in any particular society in order to make explicit statements about them is in Wolcott's (1988, p.146) opinion, the professional task of the ethnographer.

Culture, defined within ethnography, is aligned with the purpose and goals of this study. It provides a paradigm in which the lived experiences of members of this classroom can be understood in relationship to a broader and more meaningful context. Ethnography, as a methodological framework or research paradigm, is a distinct way of approaching research with particular understandings of purpose, foci, data, analysis and more fundamentally the relationship between data and its reference

(Scott and Usher, 1996, p.61). Making explicit understandings of culture, despite the limitations of creating stipulative definitions, is beneficial to maintaining purpose, ensuring focus and guiding data collection and analysis. LeCompte & Preissle (1993, p.335-336) consider such definitions of culture as being a significant factor in the execution of a study and contend that whether culture is broadly or narrowly defined, it should be clearly defined.

Thick Description

It was during a lecture in 1971 that Gilbert Ryle first introduced the term 'thick description' (Olson, 1989, p.158). The context for the use of the term was to delineate between what Rodin's *Le Penseur* (the thinker) was seen to be doing and an analysis and interpretation of his activity. Clifford Geertz (1973) gave the term prominence and now it stands as an icon of ethnography.

Thick description is a written record of cultural interpretation (Fetterman, 1989, p.114). It is the interpretation of events within the context in which they occur that results in a description being thick. Fetterman (1989, p.114) uses an example of the difference between a wink and a blink to portray the concept of thick description.

"A thin description would simply describe a rapid closing of the eyelid. A thick description gives context, telling the reader whether the movement was a blink caused by a piece of dust in someone's eye or a romantic signal transmitted across a crowded room. Thus the description would incorporate the cultural meaning and the ethnographers analysis".

It is not simply detail that makes a description thick. The description is thickened through reflecting upon the purpose and considering the situation. (Olson, 1989, pp.158-159). It is not the techniques employed or what one looks at that makes the study ethnographic. The critical element is in interpreting what one has seen. For Wolcott (1988, p.187) the ultimate test of ethnography resides in the adequacy of its explanation rather than the power of its method. Olson (1989, p.159) considers an adequate explanation as uncovering the meaning of what is being said (done) by knowing the structure in which it is said (done).

Adopting an ethnographic methodology to explore 'the way of life' of some identifiable group is in Wolcott's opinion well suited to answering the question: "What is going on here?" This is anthropologically a question of behaviours and, especially, a question of meanings (Wolcott, 1988, p.199). It is this level of interpretation and the uncovering of meanings that makes a description 'thick' and the process and product 'ethnographic'.

In this study, the concept of thick description impacts on how events and behaviours are both viewed and interpreted, and how these events and behaviours fit together to account for the culture of this group. The grand *what* and *why* questions of ethnography are engaged with clarity through an awareness of *what it is* that constitutes a thick description. Thick description is about a focus on meanings.

Educational Ethnography

There is ongoing dialogue amongst ethnographers as to whether the study of a single classroom, abstracted as a small society can adequately be considered ethnographic.

The issue considered by LeCompte and Priessle (1993, p.14) questions whether doing this will de-emphasise broad contextual and cultural factors external to the examined unit. It appears that for many traditional and classical ethnographers, their discipline is defined by extended periods of time in the field focussed clearly on the goal of the broader ethnographic context.

The argument that a narrowly defined focus will somehow neglect the broader picture is considered in Agar's framework through his notion of macro and micro culture. Agar (1996, p.238) contends that it is through an acknowledgment of the impact of the whole that you can develop an account of the specific culture. It is not that one is neglected at the expense of the other, it is simply that they do not exist in isolation and are not separable.

LeCompte and Preissle (1993, p.14) outline significant designs where anthropologists have selected units narrower than the entire community and its educational systems. Such applications of ethnography in an educational context have their genesis within early cultural anthropology. The induction and enculturation of children and adolescents into the practices and beliefs of the group was a significant aspect of early ethnographies (LeCompte and Priessle, 1993, p.10). Much of this work was with preliterate and non-industrialised groups, although it was the comparative work within educational structures in the US by such icons as

Mead in 1943 and 1951 (cited in LeCompte and Priessle, 1993, p.10) that established ethnography in education.

Numerous works have made contributions to the body of knowledge in education through the ethnography of classroom life (see Spindler and Spindler, 1993. & Schneider & Lee, 1990 for some examples). Wolcott's (1988) "life story of a sneaky kid" focussed on a single participant to illustrate an educational issue through a real event bound in time and circumstance (p.246). Though the story was specific and circumstantial, its relevance in a broader context was apparent. "The story should make a point that transcends its modest origins. The case must be particular, but the implications broad" (Wolcott, 1988, p.246). There are no doubt limitations to micro ethnographic studies, however, implicit within ethnography, is recognition of such limitations. The ethnography of classroom life has a growing academic presence with continuing methodological and theoretical debate. Ethnography provides an avenue for exploring what this study endeavours to understand, the way of life in a design and technology classroom,

Towards the Goal: Methods

In determining method, Agar (1996, p.127) suggests it is an awareness of our goals and an understanding of what will get us closer to those goals that unifies purpose and method. A reflective analysis of the concepts guiding ethnography, the perspective the researcher brings to the account, and the theoretical underpinning of the research provide both a focus of purpose and a framework for understanding how to move towards the goal of producing a plausible ethnographic account.

Contained within ethnography are no explicit understandings of method. Ethnographers use whatever means necessary to facilitate the purpose of ethnography, which, is to conger an adequate explanation. Methodology is subservient, yet intimately connected to the purpose. Wolcott (1988, p.190) suggests the freely disclosed trade secret of ethnographers is the fact that they would never rely solely on a single observation, a single instrument or a single approach. The methods by which ethnographers conduct their research are focussed towards providing data that permits adequate explanations of cultural behaviour. The lives of people are always central to the purpose of ethnography, and building an account of their 'way of life' is always achieved through human interaction and contact. This ethnographic staple is founded in the symbolic interactionist perspective of the construction and shaping of meanings through interaction among groups of people. For this reason ethnography is conducted in the field, interacting with participants in their settings. The purpose of this section is to discuss a methodological framework that accounts for the interrelationship between the collection and analysis of data and

the development of that data into an ethnographic account. I will also introduce the participants and detail my involvement with them.

Building an adequate view: Progressive focussing

Methods in ethnography are not an end unto themselves. The success of an ethnographic account is as Wolcott (1988, p.187) states, in the adequacy of its explanation rather than the power of its method. In terms of this study, an adequate methodology is one that facilitates the 'what' questions of conventional descriptive ethnography then moves beyond this to seek an adequate view of the complex interrelationships amongst data. Moving beyond descriptions of culture is a process of progressive focussing, a complex and creative process of interrelationships between the collection and analysis of data. The model proposed by Carspecken and Apple (1992) addresses these complex interrelationships and outlines a methodological framework for critical ethnography.

Carspecken and Apple (1992) examined the interrelationships between the collection and analysis of data and the development of that data into an account. Rather than detail specific methods, each stage details concepts that have implications for the selection and use of various field techniques and methods of inference. As a framework it was developed in recognition of one of the tenets of critical work, which is to think relationally, acknowledging the connections between the school as an institution, the assemblage of differential power relations and how these are continuously produced, mediated and transformed in our daily lives (Carspecken and Apple, 1992, p.549). There are five stages in the model, which are:

1. Monological data collection.
2. Preliminary reconstructive analysis.
3. Dialogical data generation.
4. Describing system relationships.
5. Explaining system relationships.

The initial phase of this model is the collection of monological data. It involves the collection of primary data, which are raw and objective to the point that others would agree with it, and is derived from the third person perspective. It is monological in the sense that it is data collected without dialogue. This phase represents the 'what is' and 'what took place' element of the research from the perspective of the researcher. The process, by which this data was collected, involved observations and field notes compiled on the details of classroom life. These observations ranged from details of the environment, behaviours and social interactions; to the style of student dress.

The second stage is a preliminary analysis of the data. While Carspecken and Apple (1992, p.515) considered this stage to still be closely aligned to the objective, it represents a movement towards the subjective realm and a drawing of inferences from the data. This analysis is for the purpose of refining focus and developing emerging concepts. After a few weeks with the class, several prominent foci began to emerge. They were untested hunches, however, representing emerging ideas to pursue or paths to follow and investigate. These first two stages are somewhat intertwined. Detailing of events doesn't finish as themes begin to emerge and neither

does preliminary analysis end as paths are followed. Burns (1995, p.253) represents these processes as a cyclic activity rather than a linear progression.

The third stage represents a shift into the realm of the subjective. Carspecken and Apple (1992, p.530) describe this stage as engaging in discussions with the participants to gain more clarity on the patterns that emerge. This phase represented a critical point in the research. As several issues began to emerge, the focus of the data collection was directed towards these patterns. Up until this time there were no informal interviews and involvement was very general. Some of the characteristics of this stage are focused informal interviewing, sensitive questioning that help participants to articulate features of their culture and feelings, and the development of contrasts between the way people act and speak in natural settings (Carspecken and Apple, 1992, p.531).

The fourth stage is concerned with examining relationships between social sites and social groups for the purpose of developing explanations based on these relationships. It is at this stage that consideration is given to factors, which though external to the examined site, may have impacted this culture.

The culture of any group will have been partly constructed by its members through the selective appropriation of cultural items generated elsewhere in society (Carspecken and Apple, 1992, p.539).

These system relationships are particularly valuable within the context of this study. A broader conception of social sites includes the scope of cultural products that

characterise it. Social sites in this respect comprise characteristics, features and artefacts indicative of that site. In this study several of these relationships were examined. Examples include: the relationships between four girls and the social and environmental setting they find themselves in, the men in this subject area and their place within the broader school ecology and the design and technology teachers and their attachment to their prior trade's work environment. Analysis of these relationships exposed categories of data and provided an avenue for the progressive focussing and structuring of this account.

The final stage in this framework endeavours to relate the findings of stages one through four to a broader view of society (Carspecken and Apple, 1992, p.541). This stage involves developing plausible explanations of system relationships previously established. It is a process of building the findings outwards, to connect the highly contextualised meanings to a wider symbolic order.

As a methodology, these five stages represent a framework within which data can be interpreted and linked in order to yield both localised understanding and systemic connections. This explanation of the depth and breadth of the issues underlying the framework has been far from exhaustive, however, it suffices in its purpose as a methodological guide. As a guide it is both conducive to the conceptual and theoretical underpinning of this study, and appropriate to achieving the goal of establishing a plausible account of aspects of the way of life in a design and technology classroom.

Participants

The focus of this research was on a class of year eight design and technology students at Seaside Senior High School¹. There were twenty-two students in this class, eighteen boys and four girls. Their teacher was Mr Pritchard, an ex-boilermaker, who now teaches various subjects in design and technology. The class met twice a week, once on Tuesday for fifty minutes and again on Thursday for seventy minutes. I was with the class for the duration of the school term, which was ten weeks. There are seven teachers in the Design and Technology Department, most of who are ex-tradesmen. Though these were not the primary focus of the study, they do share some place within the research. I met with these teachers during morning recess on Tuesdays and during lunchtime on Thursdays.²

In the field

The class was not a completely foreign environment prior to the research. Some time had been spent at the school and a working relationship with Mr Pritchard and the other teachers within the department had been developed. Some of the students in the class were known, which was of benefit to the research. Mr Pritchard and the class were at considerable ease with my presence in the classroom.

The primary source of data was detailed field notes, collected through observations and participation. I was given free reign to interact with the class in whatever manner appropriate was given. The students in this class operate mostly autonomously, which allowed the time to interact with the class through involvement in their work,

¹ All places and names have been allocated pseudonyms in order to protect the identity of participants.

asking informal questions and basically becoming a part of their circle for the period of the school term. These field notes were detailed both during the class and in a period after the class.

There were several opportunities to meet with other teachers within design and technology during morning recess in the main staff room, and during lunchtime in the design and technology staffroom. These were generally informal discussions with no agenda. The aim throughout these meetings was to become immersed in staff life during those moments without students. The design and technology staff room was not the focus of this study, however, this engagement added breadth to the research and contributed to a more meaningful insight of classroom life. The purpose of such breadth was to facilitate clearer avenues of focus and establish an understanding of prominent interrelationships amongst data.

Although field notes were the primary source of data, there were other supporting data that significantly contributed to the account. Towards the end of the study, as various foci began to develop, there were opportunities to conduct informal interviews with various groups of students. In an effort to maintain as informal a feel as possible and allow students the freedom to express themselves without constraints, these interviews were not recorded. The advantage of this approach is the freedom of expression that such an informal situation allows. The discussions were quite brief and significant chunks of data were written up immediately following the discussion.

Several secondary or marginal sources, considered to be of benefit to understanding or analysis, were utilised. Amongst these were work samples, school reports and photographs considered relevant to the research. These supporting documents provided additional evidence of the outcomes of classroom life.

The final element of data collection was an informal interview with Mr Pritchard, purposefully left until the end of the term. As various foci developed, questions pertaining to these arose. Rather than risk influencing data through prematurely raising questions relating to these issues, the natural course of events were permitted to unfold and the interview postponed until the end of the term. This was an informal interview, held after the finish of the school year in an informal setting.

The literature is replete with advice for coding data, structuring interviews and approaching participant observation (Hitchcock & Hughes, 1995; Burns, 1995; Wiersma, 1995). The key element of these approaches is flexibility and adaptability to the intricacies of the situation. There were several instances when exercising such judgement was pivotal to the research. On several occasions, situations were presented that would have impacted the authenticity of the data. These involved decisions on whether to intervene in an altercation between students; judging the most appropriate time and situation to talk to groups of students, without effect to data; which participants would best represent an insiders perspective, and the most appropriate participants to pursue as informants. These are the sort of issues that arose throughout the study that required sound judgement and sensitivity to the situation.

Distinction between the collection and analysis of data is not clear in ethnography. Analysis and collection occur simultaneously. Working in the field is a creative and social act. There is no sole method for collecting data ethnographically. It does, however, occur in the field and is, therefore, naturalistic. It is also a skill. It requires what Woods (1985, p.70) calls a sociological imagination, that is the capacity to shift from one perspective to another and in the process, build up an adequate view of the culture under study.

A Limited Perspective

Besides stating clearly the purpose of this study and its conceptual, theoretical and methodological foundations, I also considered important to make explicit what this study is *not* about. Several factors restricting the scope of this study need to be addressed in order to both clarify the purpose of this research, and address related factors beyond the scope of this study.

Many of the ambiguities that surround ethnography are in part due to the manner in which it has evolved. The term ethnography has been employed, rather generically, to refer to a variety of qualitative processes. This has prompted commentators such as Wolcott (1988, p.199) to delineate between ethnography and those who draw upon its techniques.

“Blitzkrieg ethnography” is a term used to describe an inadequate period of time in the field (Wolcott, 1985). Just what period of time is considered necessary before a study could be considered ethnographic is not quite clear. Some state at least a year, yet others consider shorter, more intensive periods, within some contexts, reservedly adequate (LeCompte & Priessle, 1993, p.14). Whilst an extended period of time in the field was beyond the scope of this study, it does not necessarily negate the study from being considered ethnographic. The argument, already addressed, is that neither time in the field nor drawing on ethnographic techniques constitutes a study as ethnographic. The key factor is whether the study represents a plausible and authentic account of the culture under examination.

The implications of ethnography as a descriptive and interpretive account must also be addressed. Embedded within this interpretation is the perspective and position of the researcher. Rather than culture being observed, it is only ever inferred through reference to a given perspective. The implication of this is that an ethnographic account can only ever be partial and incomplete.

A micro ethnography is highly specific. In terms of this study, the cultural situation of a design and technology classroom is specific. Whilst there may be some common ground amongst this group, the picture of the way of life for this group is highly specific. Ethnography, however, aims for the generic to be visible in the specific. It's not that ethnography is not concerned with representativeness, it's just approached in a different manner. The question is not "Is this case representative?" but as Mead (cited in Wolcott, 1988, p.200) once noted, "What is this case representative of?" The question of how one can move towards the interpretation of culture based on specific and contextualised situations is addressed by Wolcott (1985, p.197) through his explanation of stereotyping and generalisations.

"Abhorrent as that notion has come to be in the new found and self conscious pluralism, stereotyping also happens to be the business that one must engage in if one is ever to generalize about the expectations or standards that categories of other people hold"

For Wolcott (1985, p.197) the critical distinction is in the difference between generalising and over generalising. The reality is that if ethnography is orientated towards cultural interpretation, then certain generalisations and stereotypes are inevitably applied. Despite these inferences, ethnography is humble in its outcome.

The nature of ethnography is to develop theory, to describe and interpret what has been observed and heard, and then to attribute culture to that. Rather than attempting to answer questions, ethnography is concerned with posing questions. Because of the very process of human and social life that it claims to reveal, ethnography never can be more than partial and incomplete (Wolcott, 1985, p.197).

A limited perspective is not necessarily a narrow perspective or a flawed view; it is simply not associated with being the complete picture. The notion that ethnography is a beginning that must end at an arbitrary point is central to understanding its limitations. It is perhaps better understood as the beginning of the ethnography of design and technology education. The point oft quoted by Geertz (cited in Wolcott, 1990, p.21) that "It is not necessary to know everything in order to understand something" frames both the process and product of ethnography within its place as partial and beginning.

An Introduction

Seaside is quite old. It was built in the early seventies during a period of rapid development within the region. During this time it was nestled in the mortgage belt and considered a working class suburb. The demography of Seaside has changed significantly since this time. It is now an area of emerging affluence, occupied by the 'nouveau up' and no longer at all considered working class. As one teacher described it:

"You can pick the teachers in the morning cause they're the ones driving the crappy cars".

I was given instructions on how to come to the department to meet the staff and be shown around. The instructions, as I had experienced with other schools, involved walking down past the gardeners' shed, around the back and towards a set of tall roller doors. The department is staffed by men, all, with the exception of one, are middle aged.

The scene was not unlike some historical photographs of textile factories during the Industrial Revolution. There were machines methodically lined up in rows, ready for production with a complementing maze of extraction tubing tangled throughout the building. Everything was painted in that industrial hammer green, so reminiscent of the sixties. The floors were mostly concrete, with areas assigned for working with wood covered with aging parquetry. The walls were sparsely decorated, in strict contrast to a primary classroom I had recently visited. A few of the walls were adorned with projects reflecting the tastes of decades past. The workshops were

gloomy. There is only one classroom in this area, which is assigned to technical drawing. The rest of the areas are workshops, full of machines and materials with remnants of industrious production all around. The clutter was reminiscent of one of those antiquarian shops in which you feel as though you could find anything ever created.

Mr Pritchard is an ex-boilermaker. As was the practice, for what were considered non-academic students, he left school at fifteen to pursue an apprenticeship.

"They were readily available back then".

For five years Mr Pritchard worked on several sites including goldmines, oilrigs and prawn trawlers.

The transition from boiler maker/first class welder into teaching was not unlike many trade teachers of this era. This change was prompted by several factors. Firstly, his success with training young apprentices prompted him to feel suited to teaching.

Secondly, he had heard of the demand for industrial arts teachers through a teacher relative and finally, felt it was time for a change; time to try something different.

This was a similar story to other design and technology teachers at Seaside. Mr Mitchell was a pattern maker, Mr Trent in the timber industry, Mr Andrews a panel beater/spray painter and Mr Stanton in the Air Force. Of all the staff, only one had no prior trade background, Mr Spiers had gone straight from school into teaching.

This subject area proved a sociologically interesting environment. Throughout the period of time participating in their lives, an interesting account of this culture

emerged. Four significant aspects of the way of life in this classroom are discussed in this study. The first examines the predominant masculine culture within design and technology. The second is the story of four girls and their perceived exclusion from right of passage into design and technology. Third is an account of the various perceptions of status in design and technology compared with the more traditionally liberal pursuits. The final aspect looks at the impact of the historical genesis of design and technology on this culture.

The Home of Shed Men: Masculine identities

You may have heard of the term *shed men*, a term coined in reference to the *men* who work down the back of the school in the workshops. It is both derogatory and affectionate, and at times a self professed title. Within this title lies sets of beliefs and values about the nature of teaching and learning and the way of life that both design and technology teachers and others, external to this world, attribute to this area. This study identified, as an overarching aspect of design and technology culture, a dominant masculine culture. This dominance was manifested through the types of artefacts made, the environment in which they are made and the conceptions of technology that drive the curricula. This is the story of this dominant culture, an area built, maintained and catering for mostly men. These men are what many refer to as *shed men*.

Various aspects of the design and technology subject area render it a mans' world. Most obvious, is the distinct lack of women, both as teachers and as learners. There are no female design and technology teachers here at Seaside and in this class of twenty-two students only four are girls. This dominance permeates all aspects of classroom life. It is in many respects the overarching characteristic of design and technology culture. In the classroom it was expressed through the types of artefacts made, the environment in which they were made and the conceptions of technology that drive the curricula.

Male artefacts

The boys were eagerly completing a woodwork project as I arrived early to a class that Mr Pritchard was taking. In the far corner were two girls looking unenthusiastic and despondent. As I roamed around the class I noticed the project the girls were working on was different from the rest of the class, which were all boys. The boys were making medieval battle-axes, and it appeared the girls were exempt from making this. Almost acknowledging their lack of interest as I approached, one girl said:

"We don't even want to be here...we got duped into it".

It turned out that after telling Mr Pritchard they didn't want to make a battle-axe, he had them make a napkin holder instead. This didn't appear to spark any enthusiasm and was considered only slightly more tolerable than the battle-axe.

In the particular class that I would be involved in, Mr Pritchard made efforts to include the female students through some projects related to jewellery. These projects included wire sculptures, bangles, matchbox holders and enamelled pendants. There was a spectrum of projects that appeared to appeal exclusively to either boys or girls. Whilst projects aimed at girls had a temporary effect of capturing their attention, it was seen by the boys as 'selling them out'.

Liam: "Why do we have to make earrings and bracelets"

Mr Pritchard: No response

Liam: (directed to me) "You should go to woodwork because it's better... they don't make earrings and bracelets in there".

Rather than an equaliser, these artefacts had the effect of drawing a greater distinction between genders. Mr Pritchard was describing a procedure for making wire spirals. At the end of the demonstration there were instructions for the boys to apply this procedure to their sculptures and for the girls to consider using this for some earrings. Highlighting their presence made the girls feel uncomfortable. They were already outnumbered five to one and were being recognised in front of the whole group as requiring differentiated treatment. Rather than being seen as a gesture towards equality in design and technology, it made the girls feel out of place. The differentiated attention given to the girls offended the boys and further alienated the girls. This, and other similar examples, consolidated the notion of design and technology as what one of the girls referred to as: “a boy subject”.

This study identified support for the girls’ proposition that design and technology is a “boy subject”. Their feelings were reinforced through the artefacts students were directed to produce. The curriculum structure within this classroom promoted participation by boys through the selection of male orientated artefacts such as the battle-axe. This notion is further consolidated through Mr Pritchard’s belief that subjects, and the artefacts produced within these subjects, are indeed structured to cater for a single gender.

Mr Pritchard: “There’s an expectation that girls and boys will decide to do boy and girl subjects...It’s a shame... but we can’t do anything about it... we can tart it up as much as you like... how many boys do you get doing dance... they’d say (in a snivelling whine)... you poofster... are you wearing your leotard today”.

Like Kenway (1995), who found trade teachers to be uncomfortable with a female presence in the classroom, Mr Pritchard and his students were committed to the notion that certain knowledge was coded by gender and this was right. Mr Pritchard made some attempts to include the girls through jewellery artefacts, however, was basically resigned to the historical and cultural exclusion of girls from design and technology. The attempts made to accommodate the girls within this classroom created other problems. The boys resented this 'selling out' and the girls were conscious of change for their sake and the effect that this had on the boys.

As it stands at the moment, design and technology subjects remain options at Seaside and whilst this is the case, most girls feel compelled to choose along gender lines. Kenway (1995, p.73) raised the point that a reticence to adopt pedagogies and curricula to suit the needs and interests of girls perpetuates this problem. Despite attempts to adapt artefacts to accommodate the girls in this class, the general thrust of curriculum was clearly focussed at supporting the needs and interests of boys.

The environment

A calendar of a naked, buxom blonde hung on the rear of the toilet door in the design and technology staff room. There are no female staff to complain of what had been outlawed in the workplace for several years. This absence of women permits certain liberties for the men in this area. The jokes that are told, the language used, and the attitudes often expressed may not be possible, or would at least be problematic, in the

presence of women. This study identified this working environment as a significant aspect of the dominant masculine culture of design and technology.

The routine for the students entering the class was always the same. The door to Mr Pritchard's class is around the back in the loading bays. Students congregated by the door before entering on Mr Pritchard's command. The class filed in and took their places around the two front workbenches, as to suggest that this was a routine for which they were accustomed. The procession was long and drawn out as boy after boy raced back to retrieve something from his bag. After the procession of boys entered the room there was a pause before a single group of four girls entered the class. I noticed instantly the group of girls who took their place to the far left of the room, a considerable and noticeable distant from the boys. The workshop was arranged with two large benches towards the front of the room. Each bench was capable of accommodating around 10 students. At the rear of the room there were several brick covered soldering stations. The benches were at a sit down height with stools chained to the benches. The room was quite dirty from the dust and mess created by the machinery. The boys have no problems in sitting on the benches (there are no chairs) however the girls prefer to stand away from the boys.

The routine was always the same for the girls. They would usually enter the room after the boys and stand away from the main group. They looked like strangers in a crowded room, in unfamiliar surroundings and company.

Me: "Why do you guys always stand over here?"

Jane: "It's dirty in here"

Leah: "Everything is messy"

Their responses and demeanour conveyed an attitude towards being and working in this environment. This attitude didn't manifest itself in any kind of rebellion against doing the work, they simply looked uncomfortable in this environment. Mr Pritchard was not oblivious to the different ways in which both boys and girls approached the environment of the design and technology classroom. For him, it related to their lack of experience within such environments.

Mr Pritchard: "Boys have got more experience because they get into the old man's shed".

A look around the workshop can reveal just how intimidating this environment can be to those not yet familiar with this world. Large and powerful machines, danger at every turn, complex mechanisms and symbols associated with male culture. Gleeson (1994, p.14) describes these symbols as a definitive aspect of this culture.

"When considered within that context, the trade areas became male work environments, the industrial illustrations became male symbols and the tools and machines became implements for men's work".

The maleness of this environment is a powerful aspect of the culture within this area. Just as a little boy's or girl's room is often decorated and adorned to automatically ascribe gender, so too are the symbols assigned to this environment. Both are socially constructed notions yet equally as powerful. This environment is representative of the perception that design and technology is indeed for men.

Aside from being an impediment to the inclusion of girls in design and technology, this environment constitutes an element of security for those men functioning as practitioners within this area. Knowledge of, and the ability to master this environment contribute significantly to the identity of design and technology practitioners. It is treated as a sacred place in which propositions of change are considered sacrilege. Impending change is something that is of considerable concern to these men. There were several occasions throughout my time at Seaside when discussions of impending change invoked passionate and angry responses. The shift from a focus on manipulative skills to an emphasis on cognitive and process skills in the context of these manipulative tasks, is viewed not only as a threat to the curriculum, but also their environment.

Mr Pritchard: "The design and technology option is hard core left... pop sticks, straws and plasticine".

The perception is that the shift from industrial arts to design and technology will signal the end to hands on manipulative skills and the redundancy of machinery and tools with which they have a close affinity. They perceive their knowledge and skills as connected to the tools and machinery within the working environment. Redefining the outcomes of design and technology education threatens the stability of the environment and their identity as masters of this environment.

The environment of design and technology was identified as a significant aspect of this culture for several reasons. Firstly, the environment depicts and supports a masculine conception of design and technology and stands to secure practitioners within this conception. The security of this environment is adamantly maintained and

any forces threatening its stability are met with resistance. Secondly, the environment inadvertently isolates many female students and prevents female teachers from right of passage into design and technology through solely representing a masculine conception of design and technology. Fundamentally, this environment maintains design and technology as a masculine domain; separate from any aspect of technology or design considered feminine.

Conception of technology

The artefacts and environment, detailed in this study, reflected a broader conception of technology as a masculine domain. Foster (cited in Wolcott 1990, p.33) examines processes in applied anthropology in terms of target groups, those targeted for change, and innovating organisations, or so called agents of that change.

Conceptions of design and technology within this classroom contain values, beliefs and systems of action and organisation relating to Foster's ideas of target groups and innovating organisations. Within this classroom, boys are viewed as the primary beneficiary of such instruction and it is seen as the duty of design and technology to facilitate the future needs of this group.

Mr Pritchard: "It's not that they will all become tradesmen now... only a few may become tradesmen...when they move into a home they will know how to use a drill...they're life skills like home ec (economics)".

The design and technology department at Seaside perceive themselves as catering to a specific target group. Instinctively, this target group consists of mostly boys. The target group includes students not "academically inclined", students aiming for work

in trade related vocations, students seeking relief from the “serious subjects” and others with a particular interest in a subject being offered. The structure and curricula supports a masculine conception of design and technology which in turn determines the artefacts that are made and the learning environment in which they are made. The target group is attracted through catering to their interests at the exclusion of approaches that endeavour to include female students.

All three factors: artefacts, environment and conceptions of design and technology all point to a culture that is significantly masculine. As organising factors they intertwine and support each other to maintain the historical position of this subject area as being coded within gender. As Leah, one of the four girls in the class, so simply stated:

“It’s a boy subject”.

Strangers: The four girls

Angela, Leah, Jane and Kyra are the only girls in this class. Over the period of the school term a picture developed of their unique place in the life of this classroom. It was a decidedly different life for these girls. The story of their interaction in this classroom highlights issues in design and technology relating to perceptions of technological competence, strategies adopted by the girls for surviving in the classroom and the effects that society's broader conception of technology education has upon teaching and learning.

Technological competence

The students entered the class in the customary fashion. The boys would bustle for their prime seating position on the two front benches and after the rush of boys the girls would dawdle in and take their place at a distance from the boys. After the routine of taking the roll and Mr Pritchard presenting his instructions, the students went about their work. The four girls were working on a different project from the rest of the group. They were gathered away from the machinery and equipment and congregated around the sink at the rear of the room.

Me: Why are you girls doing a different project from the rest of the class?

Girls: We're not... the boys have finished this... we're behind.

Me: How far?

Girls: We're way behind... about a month.

This didn't appear to disturb Mr Pritchard. The girls were quiet, always worked (granted a lot slower than the boys) and caused no disruptions to the class. In terms of projects, the girls were around three projects behind. Over the period of the school

term this situation was never remedied. The girls remained significantly behind in their work.

The significance of this situation relates to an obvious difference in student performance based solely on gender. There appeared to be agreement between Mr Pritchard and the girls concerning this difference. The girls appeared resigned to not achieving as much as the boys. Likewise, Mr Pritchard was not concerned with their failure to complete the assigned projects. This reflected an attitude towards their inclusion and perceptions of the girls' technological capability. The situation was not remedied over the period of the term. The girls always remained significantly behind the boys in their workload. Mr Pritchard also remained resigned to their mutual positions.

There is no shortage of literature pertaining to the limited participation and lack of success experienced by female students in technologically orientated subjects (Wajcman, 1991, Mottier, 1996, Markert, 1996 & Kenway, 1995). Some of the contributing factors have been identified and several strategies for addressing such inequality have been suggested. Despite this, the experiences of these four girls would suggest little impact of such research in this classroom and perhaps in design and technology generally. Success for them was generally not facilitated within the framework of this classroom.

Factors that influence both participation and success within design and technology are complex. Whilst perceptions of technological competence will not account for all

problems associated with this, it was identified as a significant contributor to the situation of these four girls. As an aspect of the 'way of life' within this classroom, the limited success experienced by these bright and diligent students was significant in terms of this study.

Strategies for survival

The group of girls always worked together. On one occasion they needed to use the oxyacetylene torch to complete an enamelling project. The oxyacetylene hand piece was next to the girls' worktable. I could hear them discussing how to turn it on and light it. None of them were game enough to try, so one of the girls went to Mr Pritchard claiming that the "thingy" on the torch was stuck. This prompted Mr Pritchard to come and check what was stuck, light the torch (as nothing was really wrong) and demonstrate how to melt the enamel. In fact Mr Pritchard completed the job without their having to operate the machinery at all. This is the equipment that the boys race to and appear so confident in using, yet for this group of girls its operation was unknown and fearful.

Avoiding the use of machinery was a deliberate strategy employed by the girls. The way in which this was achieved enabled them to both save face yet complete the necessary project. This was an example of strategies the girls used for dealing with the pressures of life in design and technology. Their self perceived lack of skill and knowledge, required for executing certain procedures, was one such pressure. This study identified another pressure as the subjection to incidents of bullying and dominance by the boys in this classroom.

On one occasion, early in the term, the girls were talking in the corner of the workshop before approaching Mr Pritchard with a request to work in the next workshop. This workshop was vacant during this period and is separated by a partition. The girls were given the OK to work next door, after which he turned to me, shook his head and said:

"Too many boys"

This was to suggest that this was the reason for such a request. The workshop next door was a woodwork room that was not equipped with the necessary tools for the girls to continue with their work. This practice continued until the end of the semester. On most occasions, the girls were allowed to work on their own away from the rest of the class, in the adjoining workshop. They appeared more content with this isolation and more productive within this environment. The change of location was not utilised by the girls as an opportunity to avoid work. It was an opportunity to leave an environment that, for several reasons, made them uncomfortable.

Angela came back into the main workshop to use a moulding anvil to form a bracelet she was making. For this she needed a wooden mallet. She moved to the rack and chose the mallet, then made her way to the anvil. These mallets were in demand today and as Angela was positioning her bracelet she held the mallet under her arm. One of the boys walking past, in need of a mallet, grabbed the mallet from Angela and moved away to complete his job. This brought complaint and a demand for it back, which was ignored. Mr Pritchard was in the distance and unable to keep tabs on 22 students all working on different tasks. Angela clearly knew she was a loser in

this situation, dejected and frustrated she returned to the next room to do nothing.

After a few minutes I went in to see how her bracelet had turned out. She told me the story of her injustice in that way that only year eight student's can.

Me: "Does this happen often?"

Angela: "The boys just hog all the stuff."

This incident had a significant impact on her motivation in the class. It was all too hard and the fight was perhaps not worth fighting. This was not an isolated case of the boys bullying the girls. The boys would generally control access to the equipment. They were first in the queue for resources, and access for the girls were subject to them. Sometimes they tried and lost but often they just relented. This was one of the significant factors contributing to them being behind in their work.

Both the girls' desire for isolation and the accommodation of this separation is significant in terms of the inclusion of both genders in design and technology. For the bulk of the school term, the girls worked unsupervised in an adjoining workshop. They remained significantly behind in their work, despite the class being made aware of the impact that this would have on their grades. For the girls this isolation provided respite from a world that was dominated by boys and isolated and marginalised them from their work. It could be viewed as a strategy for simply avoiding work or accommodating greater autonomy and freedom from the class. However this view is inconsistent with the character of these otherwise diligent and enthusiastic students. The productivity of the girls was higher when working alone, and it is far more plausible to interpret these events as a response to their sense of

distance from this subject, their lack of success within this area and the bullying they were subjected to.

Extraneous influences

Several factors account for the unique experiences of the four girls in the design and technology classroom. Their involvement differed from that of the rest of the class and the way in which they adapt to deal with the pressures of classroom life were also unique. The dominant masculine culture within design and technology is one way to account for both their different experiences and also the way in which they cope with these experiences. There were also other incidences arising from this study which point to extraneous factors that influence the experiences of the girls in design and technology.

One morning I joined the girls in their discussion, which mostly involved lots of giggling. We talked about the reasons for their being so far behind the rest of the class.

Me: "So why are you all so far behind in your work"

Jane: "the boys won't let us use the equipment".

Leah: "it's more for boys".

Me: "What do mean it's more for boys"

Leah: "It's a boy subject"

Leah: "It's dirty in here... everything is messy"

Jane: "boys like making things more"

Angela: "yea... it's not a girls option subject"

The girls made it clear that this was really not the place for them. This perception didn't manifest itself in any kind of rebellion against doing the work; they simply didn't quite know how they should be acting, responding and functioning within the life of the classroom. The girls' detachment from complete involvement in design and technology is a complex issue. Their involvement takes place against a backdrop of what it means for them to be involved, and what their involvement means to those who impact their educational experiences. How they perceived their place in design and technology and the perception of their involvement by their parents and teachers were all factors arising throughout this study.

The issue of parental perceptions of the girls' involvement arose while discussing the impact that their lack of success in finishing the projects would have on their grades.

Me: "What does this mean for your grades"?

Leah: "We'll probably get bad marks" (others agree)

Me: "How do you feel about that"?

Leah: "Don't really care... my parents don't care what I get in design and technology".

Angela: "You're not exactly going to take it up as a job"

Their participation in what has traditionally been a male dominated area contradicts certain premises, values and understandings about what constitutes worthwhile knowledge and learning for those participants. Not only does this subject area perpetuate these understandings, but they are also shaped by the larger social, cultural and political contexts. Understanding or analysing their lack of participation

and success necessitates an understanding of what the girls perceive as their right of passage into design and technology, how their parents understand the value of knowledge associated with this subject, the position of teachers on their participation and the social constructions of the broader community that impact these perceptions.

Analysis of the four girl's experiences invokes several questions. Do the girls feel they warrant equal right of passage into design and technology? Do parents understand the benefits of the learning outcomes associated with design and technology? Do teachers consider it as necessary for girls to achieve competency in these outcomes as it is for boys? How does the broader socio-cultural context shape the perception of the girl's involvement?

All these questions pertain to the experiences of the four girls. They clearly felt that design and technology was "more for boys". They felt that this right of passage into design and technology was only partially theirs. The parents also considered their participation as not all that vital. Whether this relates to a perception that design and technology has a lowly academic status, is not related to their future employment or is a gender specific subject is not clear from this study. Their parents' perceptions do, however, contribute to the shaping of what their participation means to them. It may have been that neglect of the girls' interests, by Mr Pritchard, could have been symptomatic of his perception of their place in this classroom. He possibly endorsed the view that design and technology is gender coded. Alternatively, he could welcome their participation, yet consider achievement as not as important as the boys'. This may be based on the belief that, in the long run, it is the boys who will

benefit most from participation in design and technology. Finally, there is no denying the image and socially constructed stereotyping related to studies in design and technology (Williams, 1996; Wajcman, 1991; Markert, 1996). The general perception in the broader community supports the notion that certain pursuits are coded within beliefs about what it means to be male and female.

The story of the participation and experiences of these four girls was a significant aspect of the culture within this classroom. As a minority within the class and in the context of the learning area, their story is rich. For these girls, life within this class was not the same as for the boys. They were not privy to the same curricula nor the same level of support as the boys. The dominant masculine culture, and the experiences of these four girls, are closely related. As an aspect of this culture, there is evidence to suggest that participants involved in the educational experiences of the students in design and technology attribute different roles and expectation based on the gender of the student. The students, their parents and Mr Pritchard demonstrated gendered attitudes towards participation, success and relevance.

The order of merit: Our place

Throughout this study there were evident perceptions, both internal and external, concerning the place of design and technology within the educational structure of the school. The perceived status of design and technology is grounded in an established social, political and historical context that continues to strongly impact this subject area. This context shapes perceptions and these perceptions manifest themselves in the life of the classroom. This chapter explores some of the ways in which both internal and external perceptions of design and technology were represented within this department and how these factors impact the classroom.

Location

The location of design and technology, both geographically and socially, is a prominent feature of this subject area. It is both geographically and socially isolated from the rest of the school and the furthestmost building from the administrative hub. This study identified this isolation as having a significant impact on the routines and rituals of this area.

All staff are required to attend recess in the staff room. This is largely an administrative meeting in which teachers collect and peruse information from their pigeonholes and attend to various announcements and presentations. There is generally little time for socialising prior to the next period. The design and technology staff are usually the last to arrive and they make their way, with coffee in hand, to the table in the far left hand corner of the room. It's the same table each day.

The design and technology department's geographical position can be understood in a number of ways. Gleeson (1994, p.15), in his study, interprets their segregation as an illustration of intellectual and cultural differences amongst learning areas. Despite the validity of the utilitarian arguments concerning access and noise, this segregation could be interpreted as encompassing greater cultural significance. Design and technology at Seaside is still an optional and marginal subject. Its geography could be explained in terms of its value. Design and technology is distant from the centre of power of the school; the administrative block and the traditionally powerful learning areas. Their location embodies, perhaps unintentionally, a certain inequality. University of Chicago geographer J. Brian Harley (cited in Kaplan, 1996, p.5) writes:

"The distinctions of class and power are engineered, reified and legitimated in the map... the rule seems to be the more powerful, the more prominent, to those who have strength in the world shall be added the power of the map"

This geographical segregation perpetuates a cultural and social isolation from the other learning areas.

Different routines take place during the lunch break. It is generally considered too far to go to the staff room, so design and technology has equipped their department staff room with a fridge, microwave and other utensils of self sufficiency. Most days Bob, the school gardener/handyman, joins them for lunch. He has established a good relationship with the men in design and technology and feels socially at ease in their company. Bob's affinity with this area is significant in building a picture of the social culture of design and technology. Where perhaps distinctions between occupations would impede such relationships with the staff of other learning areas, it has not been

the case in design and technology. Bob's relationship with these men is symbolic of its associated status. Design and technology and the attributed terminology used to describe this subject area all point to the perception of design and technology as a working class, non-academic field that is distanced from the more traditional learning areas.

Several examples highlighted the manner in which design and technology adopted policies and practices that set them aside from the general school culture. The teachers boycott the corporate staff room for lunch, they have developed their own policies for managing student behaviour and the perception is that life down here operates in a different way and necessitates different rules.

There was a tentative knock on the staff room door at lunchtime.

Finn: "Can I go now Mr Pritchard"

Mr Pritchard: "Have you finished cleaning up"

The rules for dealing with student problems differ from the official policy of the school and other learning areas. They have been developed in response to the perceived differences and uniqueness of design and technology. An organised network of scab duty, cleaning up workshops during lunch and internal detention with the head of design and technology are strategies used in preference to the official MSB (managing student behaviour) policy of the school. Snubbing of official school policies is tolerated through the recognition that design and technology staff consider the workshops to be a unique learning environment that requires a different approach.

Mr Pritchard: "They have no f...ing idea of what goes on down here... they don't understand how workshops operate".

Despite the reasons for the geographical segregation of design and technology, a social segregation of teachers and a perception by students that design and technology is an annexed appendage of the school is influenced by this segregation. The remoteness of design and technology is something that is identified by both staff and students. It is a significant aspect of the culture within design and technology and the impact that this isolation has on the classroom is also significant. It has resulted in the adaptation of school policies and practices and created a culture that continues to be distanced from the general school culture. The location of design and technology, both geographically and socially, is a significant aspect of the culture in this classroom and a significant aspect of the broader picture of design and technology culture.

Internal perceptions of design and technology

An interesting aspect of this study was the various perceptions of design and technology expressed throughout the school. These perceptions proved important in the development of the broader picture of this subject area.

The design and technology table in the main staff room often doubles as a troubleshooting counter. School staff bring various requests to the table including: fixing the hurdles for the physical education department, taking photographs of the football team, casting a new component for a light fitting and various other utilitarian

requests. These men, and their subject curricula, are largely viewed in terms of its utilitarian usefulness. Some of the teachers object to the position taken by the other faculty in respect to this, but mostly they accept it and are flattered by others' acknowledgment it.

As with most schools, teachers often commit to serving on committees within the school. Mr Pritchard is the school safety officer, which for him is in line with his skills and expertise. There are positions considered more significant or prominent than others. Policy implementations, budgetary and finance, future buildings and professional development committees are considered to be the elitist and premier positions. These, I was advised, generally don't go to design and technology staff but are held by members of the compulsory subject areas.

Central to the transition to design and technology is a desire to upgrade the validity of technology education (Walsh, 1993). Redefining the image of technology teachers is a part of this transition. No longer do proponents of change want design and technology to be viewed in the light of their historical past or curricula origins. One of the issues confronting this change is that much of the identity of this group is connected to their affinity with their skills and abilities as craftsmen and tradesmen. The affront of such dramatic change and redefinition is the threat that this places on their identity, both personally and professionally.

The notion of social classes being aligned with subject areas is reflected in discussions of both the future and present position of design and technology. The

staff's general perception is consistent with its place within the greater school curricula. It is still an option, it is still marginal and it must still fight to attract a clientele.

Mr Pritchard: "Subjects like Maths and Science don't have to fight to attract students into their classes".

The staff have an awareness that their subject is judged against its historical working-class origins. They construct their identity and that of their subject within the framework of this historical perception. They also judge how they themselves, and their subject area, are perceived by others, based upon this constructed identity.

Students also share in the idea that design and technology is marginal and not aligned with subjects that they consider important. They express various reasons for being in design and technology, all of which are underpinned by the perception that it is not as valuable or prestigious as the more academic subjects.

Angela: "You're not exactly going to take it up as a job"

The attitude that coming to design and technology to make things and gain some relief from the rigours of the more academic subjects was prevalent. Students didn't rank projects in design and technology as vital to their particular employment or future opportunities.

Brett: "It's not as though we're going to go and make matchbox covers for a living".

Students were often resigned to the belief that what they were learning was irrelevant to their future. The view of the students is that their membership in an urban middle class society has prepared them for another kind of life. The failure of Seaside to

redefine studies in design and technology to accommodate this demographic and the changing nature of society has resulted in a diminished perception of the value of design and technology. It is viewed by the students as “a fun subject” but largely irrelevant.

Seaside was once a part of the suburban mortgage belt. The clientele of the school was very different when the school was built 25 years ago. Four of the teachers were at the school around fifteen years ago when the school catered to a different generation, in a different era. All of the design and technology staff entered their employment in education at a time when tradesmen were recruited to fill the demand of a much-needed base of skilled tradesmen. Whilst society has changed exponentially, the subject has struggled to remain relevant to the needs and interests of its students.

The perceptions of design and technology held by its staff, students and other teachers within the school were a prominent feature of this study. These perceptions were highlighted as conforming to the historical position of design and technology as both the domain of men, and a precursor to a working class, trades occupation. As part of the picture of design and technology culture, these perceptions are significant in both explaining and shaping the culture of this area.

External perceptions of design and technology

Perceptions of the status and value of design and technology are reinforced and perpetuated by forces external to the school ecology. Parents were aligned with the

perception that design and technology provided a welcome respite from the rigours of the academic subjects, but had little to contribute to the future of their children.

Leah: "... my parents don't care what I get in industrial arts"

Leah: "It doesn't matter what marks I get in the fun subjects like Industrial Arts and Home Ec (home economics)...you do your best and have fun"

The students described design and technology, home economics and art as "fun subjects".

Me: "what do you mean by fun subjects?"

Leah: "Not the real ones like maths and English and stuff"

Me: "What do you mean by a real subject"

Leah: "One that you need to do...important stuff...this is mostly for fun"

Whilst the reasons for such perceptions are unclear, there are several possibilities. Parents may judge studies in design and technology in the light of either their prior school experiences, general perceptions of trade orientated learning or the artefacts that their students produce. However judged, it is perceived as having a low status, low worth and in many cases, low applicability to their children.

Judgements are also made according to the broader society's perception of working class pursuits and occupations. Unlike the arts, which has traditionally enjoyed superior intellectual status through its association with the aesthetic, technological pursuits, aligned with utilitarian artefacts, have a working class connotation. For those parents of emerging affluence, subjects of this nature may be perceived as offering little towards their children's expected future place in society.

For some parents, the perceived outcomes of design and technology are judged by the artefacts the students produce. Little explicit awareness is developed of the learning and problem solving strategies used to create the artefact, therefore the validity of the subject is judged by the artefact produced, not the processes and other cognitive expertise involved. This issue is further highlighted in this class, with the selection of highly gendered artefacts and contexts that are perceived as irrelevant to the students. The students have not been made aware of other outcomes associated with design and technology, which further cements the perception that it is about producing predetermined artefacts.

Throughout this study participants demonstrated an awareness of the place of design and technology within the ecology of the school. In terms of this study, these perceptions represent important details of this culture. Beliefs about the place of this subject area form a significant part of the picture of the culture in design and technology.

The Apprentice Master

The final aspect addressed by this study relates to the significance of the relationship between the predominant trades and labour history of the design and technology staff and the teaching and learning within this area. This history can be viewed as contributing, through its conception of technology, to the relationships with the students expressed through teaching and learning. Both the expectations of those relationships and the pedagogy underpinning teaching and learning in this area contained a certain cultural uniqueness. Significant elements of a “tradies culture” as detailed in Gleeson’s study (1994) were implicit in the teaching and learning within this classroom. This was expressed in Mr Pritchard’s perception of his role as “trainer/educator”, the style of classroom management and the types of learning activities undertaken.

About half an hour after the beginning of class Mr Pritchard realised that a student had disappeared. The workshops intertwine; it’s a bit like an Aladdin’s cave of interesting artefacts and machinery strewn throughout the complex. Getting distracted by the happenings of another class or some other design project is easy. Mr Pritchard left me to watch over the class while he went on a reconnaissance search of the missing student.

It turned out that two students had actually gone missing. Mr Pritchard returned a few minutes later with Tom and Finn by the scruff of the neck, both students poised on tiptoes by the force of the grip. Both arms were fully extended and slightly facing the front so Mr Pritchard formed a triangle with the boys. It was in this stance that

Mr Pritchard began his chastisement, silencing the rest of the class with demands for an explanation of their absence. The boys' demeanour looked accepting of their position, slightly apologetic for their crime and even appreciative of the attention.

Finn and Tom never had a chance to respond to the barrage of questions, which were rhetorical anyway.

"What makes you think you have the right to leave my classroom without my permission"

The barrage subsided; Mr Pritchard had made his point, displayed his authority and set the example to the rest of the class. Both students returned to their projects unfazed and the silence withered as the class returned to an industrious tone.

There were certain students that simply perplexed Mr Pritchard beyond any rational and recognisable explanation. Finn was one of three students that clearly annoyed Mr Pritchard. Liam, the most disliked, was a self-confessed communist. In reality, I found his knowledge of communism to consist of the ability to draw a hammer and sickle which, for some reason, annoyed Mr Pritchard. He was jovial, light hearted and constantly made his presence in the classroom known. Liam never took things very seriously, particularly design and technology. Tom, another of these students, was as eager as they come. He was well ahead of most students, although his quality of work was not the most advanced. Sure, he was a bit silly at times, but none of the evidence seemed to fit his inclusion in this group. Finn was the third character; in this instance with good reason. He hadn't quite learnt the rules of the schooling

process yet. He was constantly getting in trouble for talking during demonstrations and leaving the classroom to investigate.

It became clear that a certain trend was evolving in relation to these three students. Over the period of the term there were numerous confrontations between Mr Pritchard and these students. Neither of them would conform to the expected conventions of life within this classroom. All three students had similar personalities. They all joked around a bit and didn't take design and technology too seriously. The way in which they approached their tasks signalled they were willing to challenge such conventions. Liam, on various occasions challenged the validity of what he was asked to do. If he didn't perceive it as relevant he would say so. Tom, on the other hand, would conform but took every opportunity to express cynicism of the work. In doing this, Tom was not only challenging the value of the work but also the authority of Mr Pritchard. Finn would challenge everything. He defied the conventions of classroom rules and procedures and Mr Pritchard's authority. Neither of the students, with the odd exception of Finn, would express these challenges in a tremendously disruptive manner. It was usually more subtle.

"Why do we have to do it like this?"

"Why do we have to make this?"

"This is stupid"

Interpreting Mr Pritchard's reaction to these challenges within the context of a master/apprentice relationship, provides some explanation of his reaction. Whilst this study does not examine the master/apprentice relationship, it can not be ignored as a

significant factor in understanding teaching and learning within this classroom. It is a powerful historical element of this subject area and has implications for the relationship between Mr Pritchard and his students.

Many aspects of the master/apprentice relationship contain conflicting pedagogy to that of a redefined design and technology education. Apprenticeship training has traditionally constituted: a set body of knowledge and skills to be acquired, a distinct order to the mentor/subordinate relationship between master and apprentice, a well defined manner in which the apprentice acquires knowledge and skills and a profound sense of the 'place' of both apprentice and master within the prescribed industry. This utilitarian ideology is a distinctive aspect of the master/apprentice relationship and a part of the trade's culture. This study identified an affinity with this culture as an influence and impact on the life of this classroom.

The conflict between this utilitarian perspective, and the constructivist underpinnings of a redefined design and technology, may account for both resistance to that change and the reaction of Mr Pritchard to the challenges of this order. Embedded in this perspective are established beliefs and values pertaining to the student/teacher relationship. These perspectives contribute to the identity of design and technology teachers, whilst elements of change that threaten that identity are challenged. The emerging differences between a familiar trade's culture and that of a redefined design and technology education provide some explanation of this conflict.

As it turned out these three students received very poor grades at the end of the term. Liam and Finn both got a 'D' and Tom scraped in a 'C'. Their grades were one way in which they were assessed according to their willingness to conform to the prescribed order within the class. The policy for facilitating such power is in the addition of an "attitude mark" to the students' final score. In theory, this represents a small percentage of the final score, however, in reality, it accounted for the low marks of these three students, despite their having completed the work.

Throughout this study, the relationship between Mr Pritchard and his students was viewed in terms of the master/apprentice relationship. Within this association the students are viewed as empty vessels that require a prescribed set of skills and knowledge for their future usefulness in the workforce. Design and technology is largely considered as catering to 'real life' skills and having direct connections to vocational training.

The 'trades culture' that impacts design and technology has specific implications for accommodating pedagogical change within this subject area. The emerging philosophy and ideology of design and technology is in many ways incompatible with the view of teaching and learning that this culture perpetuates. The world of trade and industry, which has been the training ground for Mr Pritchard and many of his colleagues, has very defined social rules concerning the structure of that micro-culture and the function of each member. Aspects of life within this design and technology classroom reflect an ongoing affiliation with the routines and rituals of the workshop. Various works (Willis, 1977; Turkel, 1972) have examined working

class life and particularly the trade/workshop floor. These studies have identified a definitive culture that operates amongst this community. Characteristics of this trade's culture, including perceptions of authority, leadership, transmission of skills and knowledge and attitudes to various social classes were represented in this design and technology classroom.

The strong affinity with a trade's background was a significant aspect of the life in this classroom and the area at large. This aspect of design and technology culture both accounts for, and is strongly connected to other elements identified in this study. The dominant masculine culture, the experiences of the girls, and the status of design and technology share similarities with the culture of the workshop floor. It builds on previously identified aspects of this culture and formed a significant element of classroom life.

Implications

The potential of ethnography in educational research resides in its ability to be what Sultana (1995, p.123) describes as a meditative and reflexive vehicle. As a methodology, the work of description, analysis and reflection invoke the substantial questions pertaining to understanding and making sense of our way of life. For design and technology, confronting the implications that this culture or way of life has for teaching and learning is a part of that reflexive process.

The necessity of confronting the implications of the culture within design and technology is increasingly relevant in light of current changes. The landscape of design and technology is dominated by a significant redefinition of the learning area. Whilst a new curriculum direction is impending, these changes involve a more substantial metamorphosis, involving a new philosophical and ideological direction.

This study examines four aspects of the culture within the design and technology classroom. An interpretation of this culture contributes to an understanding of design and technology, its place within the school ecology and its place in the broader community. More specifically, the identified characteristics of this culture have implications for teaching and learning within this area.

The first cultural characteristic identified by this study, was the dominant maleness within design and technology. Conceptions that characterise this subject area as masculine are embedded into its way of life. This has implications for those who challenge such conventions, or are subject to the consequences of them. The story of

the four girls was representative of the second identified aspect of this culture. Institutional barriers to their successful *right* of passage into design and technology are issues arising from an analysis of their place within this classroom. The third cultural feature identified by the study was internal and external perceptions of the status of design and technology. The historical origins of utilitarian orientated pursuits, contrasted with the dominance of liberal pursuits in the curriculum have helped shape these perceptions. These perceptions have implications for the politics of change and redefinition within design and technology. The culture of teaching and learning in design and technology, and its affinity with a trades culture was the final theme identified. This highlighted the distinctive teaching and learning strategies associated with the historical origins of design and technology, the master/apprentice relationship. This entrenched set of practices may impede curriculum change and associated reforms in pedagogy. The intention of this section is to address how identified aspects of this culture impact teaching and learning in design and technology.

Challenging identities

Kenway, (1995) regards many of the emerging changes in design and technology as a threat to the masculine identities of these men.

“In technology subjects, manual skills are no longer valued over mental, nor is practice valued above theory. Many ‘old tradies’ find this hard to accept because their personal and professional, indeed their male identity, has been so strongly connected to their distance from ‘all this airy fairy nonsense’ (Kenway, 1995, p.75).

This study identified a number of features of design and technology that supports Kenway's (1995, p.75) notion of 'distance'. What was considered to be "airy fairy nonsense" for the participants of this study, consisted of more than simply the redefinition of knowledge and skills in design and technology. There are aspects of the way of life in this classroom that maintain significant distance, in the form of physical, social and political segregation, from the mainstream ecology of the school. This study also highlights the connections between the personal, professional and male identities of the design and technology staff, and the distance they maintain from the broader school community.

An overarching aspect of the culture maintaining this distance is the dominant maleness of design and technology. The very nature of this subject area, as expressed through the artefacts made, the environment in which it occurs, and the living conception of technology within this area, demands certain isolation and separation. This removal is not necessarily represented by the physical segregation of genders, although often the case, but an identification and affinity with what makes it masculine and a distance from aspects considered feminine. Members of this culture acquire a certain competency with the routines and rituals that define it as masculine, and few challenge it. Significant implications flow from this distance. Not only does this distance maintain and perpetuate the maleness of design and technology, but it also isolates various participants from rite of passage into its study. In doing this, the depth and breadth of studies in design and technology becomes neglected as those elements outside accepted conceptions are avoided. The risk then becomes that valid

interests, and minority participants who harbour such interests, become alienated from participating in design and technology.

Restricting 'right' of passage

The four girls were representative of those students isolated as a result of the classroom culture. This isolation was based on judgements of their technological competence, and internal and external perceptions of their place within this learning area. They themselves recognised design and technology as “a boys’ subject” and conformed to beliefs about their technological competence. Both internal and external forces contributed to an understanding of their perceived place within design and technology. Distance, as proposed by Kenway (1995, p.75), is, in this circumstance, defined by the notion that knowledge and skills in design and technology are coded by gender. The artefacts produced, the environment in which they are made, and the conceptions of technology within this classroom all support this notion.

An element of the culture in design and technology restricted these girls from an equal right of passage into this subject. The limited participation of girls in science and technology subjects is well documented (Markert, 1996; Wajcman, 1991) with both internal and external factors contributing to this inequality. The established order within design and technology continues to perpetuate this situation, with underlining characteristics of this classroom a major contributor to the girls’ lack of success and involvement. This study identified a curricula and environment that predominantly benefited the boys, whilst excluding the girls from equal involvement.

Rectifying this situation necessitates addressing the inherent inequalities and conceptions of technology that, at present, dominate this subject. The girls' story highlights a significant implication of this culture, which, for the girls, is a diminished level of success and opportunity in design and technology, both now and in the future.

The paradox of status

Internal and external perceptions of the place of design and technology within the school curriculum form a significant aspect of the culture within this classroom. Design and technology is both geographically and socially isolated from the rest of the school. Its perceived position as a subject that produces utilitarian artefacts further isolates it on the basis of curricula. External perceptions, influenced by classical elitist conceptions of manual work, continue to impact the status of design and technology. This notion is further accentuated in the context of Seaside's emerging affluence. These factors help shape an internal view of design and technology that is distanced from an egalitarianism position on the dignity and value of technology subjects.

Passive acceptance of their place within the school ecology is contrasted with what Gleeson (1994) identified as an attitude that the work of design and technology is applicable, real and distanced from the self indulgent notion of pursuing knowledge for its own sake. There is a unity and camaraderie amongst these staff based on shared beliefs, values and their association with the 'real world' through their trade background. There is a profound awareness of the perceived low status of design and

technology, and a shared belief that equality should be pursued. However, as Kenway (1995, p.75) also identified, there is paradoxically a belief that design and technology remain distanced from all the “airy fairy nonsense” associated with general education.

The various (and often contradictory) perceptions of the status and place of design and technology perpetuate the geographical, social and political distance between learning areas. The continuation of this distance has broad implications for both teachers and learners. Whilst maintaining this distance is an aim of those affronted by an impending redefinition of design and technology, doing so limits the potential of design and technology to upgrade its status to an egalitarian position of equal value and dignity. This distance between learning areas on the basis of status continues to dictate participation by students and teachers in the business of design and technology.

Walsh (1993, p.160-161) outlines the considerable progress that has been made in upgrading the status of technology education in the United Kingdom.

“It is, however, as vital now as ever to reflect on the unreason of the previous low status of technology, and, positively, on the real educational values of this area. This is partly to inhibit backsliding, considering the venerability and pervasiveness of the prejudices involved and all we know about the difficulty of consolidating curriculum change.” (Walsh, 1993, p.161)

The current divisions embody prejudices that have implications for curriculum change, teaching and learning, and the attainment of equality. Reflecting on the characteristics of this classroom, which ascribe status, is a concept at the core of ethnographic intent. Various perceptions of the status of design and technology proved a pervasive element of this culture and are shaping as a significant impediment to proposed reforms.

Challenging the order of knowing

The girls were not the only marginalised persons in this class. The three boys were alienated from successful inclusion and participation because of their resistance and challenge to a well-defined and rigid conception of technology education. The trade background of these teachers contributes to a particular view of pedagogy and practice (Gleeson, 1994, p. 11).

“Essentially, this attitude was based upon the premise that work involved production achieved through the application of male strength to materials in order to reform them to socially useful artefacts. According to this view, forms of labour traditionally performed by women, by definition, would be excluded from the social category of work. Also, intellectual activities, irrespective of whether they involved production, also could be excluded.”

Such exclusive conceptions of design and technology, defined through a strong connection with a trade background, are challenged by the emerging redefinition of design and technology. The challenges by Liam, Tom and Finn were interpreted as recalcitrance or rebellion. In reality, these three boys were not demanding students. Their conformity to the set work, despite such challenges, is testament to their

attitudes to school. Design and technology was unable to facilitate their needs and respond appropriately to those differences. The forces of change capable of facilitating educational differences, like the impending implementation of the Curriculum Framework (Curriculum Council, 1998) and the Student Outcome Statements (Education Department of Western Australia, 1998) are viewed, by many staff, as contrary or irrelevant to the work in design and technology. Many maintain a distance from this change, despite its inevitability. It poses a threat to their personal and professional identity through the uncertainties of change, and aspects of this change that threaten the masculine dominance of design and technology.

The influence of a utilitarian pedagogy, inherited through the strong affiliation with a trade background, poses some significant implications for design and technology. Educationally, it limits the learning potential provided through student centred approaches and, like the three boys, creates students at educational risk. Narrow conceptions of learning in design and technology alienate and marginalise various participants from pleasure and success in school. The possibilities for conceiving design and technology are as diverse as the possibilities for achieving the desired learning outcomes of this area. The dominant conceptions identified in this study restrict such possibilities. This study endeavours to go beyond the traditions of conventional ethnography and raises the issue of how aspects of this self-contained culture are contributing to its own demise.

Summary

The aim of this study was quite simple; to know and understand more of the 'way of life' in design and technology. As a subject area challenged by the complexity of change and human experience, analysing and interpreting this culture is of increasing relevance. An analysis of the underlying, yet powerful notion of culture within this subject area provides another avenue for understanding classroom experiences.

Wolcott (1985, p.202) advises more attention be given to classroom culture if we are to ever fathom how schools remain so remarkably the same, in spite of persistent and well intended efforts to change them. It has been the intention of this study to grant such attention to the culture of design and technology, to examine its features and characteristics, the beliefs and values that define and maintain its curricula goals and explore the routines and rituals that characterise this way of life.

This study identified four key elements considered aspects of design and technology culture. The first identified elements of classroom life that characterise it as dominantly masculine. The artefacts, environment and conceptions of technology were revealed as perpetuating the notion of design and technology as exclusively a "boy subject". The experiences of the four girls were the second aspect of this study. Their story revealed how a dominant masculine culture impacted their classroom experiences, and restricted their equal participation and success in design and technology. The third element identified established perceptions of the place of design and technology within the ecology of the school. These perceptions were significant in terms of shaping and reinforcing the position of design and technology in the structure of the school. The final element addresses the connections between

the trades culture and that of design and technology. It identified this subject area's affinity with this culture and the manner in which it impedes proposed reforms.

Identified elements of this culture are considered interrelated. The processes that determine this culture are complex, and what this study hasn't addressed in any detail are the macro cultural factors that participate in shaping this culture. This is but one of the substantial questions raised as the result of this inquiry. Each of the aspects of this study reveal further questions and present further opportunities for inquiry.

Kaplan, a travel writer, once lamented that answers vanish as one continues to travel; that there is only further complexity, that there are still more interrelationships, and more questions (Kaplan, 1997, p.7). Ethnography is also a journey. The destination is unclear and at the end are further complexities and further questions. Some comfort lies in the oft-quoted refrain of ethnographers, that you don't have to know everything in order to understand something (Geertz, cited in Wolcott, 1990, p.21). In fact the strength of ethnographic methodologies and their contribution to education is in the questions which are raised.

This study began with the broader question of seeking out the characteristics and features of the design and technology classroom; a question of meanings, not just behaviours. Those features and characteristics identified by this study represent a portion of the ethnography of design and technology. The notions that ethnography ends at an arbitrary point, and that culture is transient are central in understanding that the ethnography of the design and technology classroom does not finish

(Wolcott, 1985, p.197). Elements of this culture that shape teaching and learning have been identified, however, this study also raises further questions and identifies further interrelationships. It unfolds the way of life in this classroom and exposes its complexities, the impact of its history and the politics of masculinities.

The product of this ethnography claims no vestige in the complete picture of design and technology culture. Because of the very process of human and social life that it claims to reveal, ethnography can never be more than partial and incomplete (Wolcott, 1985, p.197). Kaplan (1997) wrote that no two travellers interpret the same people and environment in the same way. The insights of ethnography are often produced from competing frames of reference and rationality (Hammersly and Atkinson, 1995, p.251). Meanings, as Bruner (cited in Gray, 1996, p.30) contends, are radically plural and always open. What remain are possibilities for understanding and interpreting and possibilities for knowing.

This story belongs to anyone who accepts the ethnography of a design and technology classroom as an abstraction of a small society to which they can glean meaning from an understanding of its features and characteristics. Although it is specific in terms of who and what was studied, relevance is attained through its connection to the general. This study provided a snapshot of what is a unique micro-cultural element of the school ecology. However, it also exposed complexities and interrelationships that warrant further investigation. The irony of this culture is that elements within this culture have seen design and technology neglected in terms of research. It is hoped that this study will contribute, in some way, to an understanding

of the 'way of life' in design and technology and all the possibilities and limitations that this entails.

References

- Agar, M. (1996). The Professional Stranger. (2nd ed.) San Diego, California: Academic Press Inc.
- Best, J. & Kahn, J. (1993). Research in Education. (7th ed.) Boston: Allyn and Bacon.
- Bogdan, R. & Biklen, S. (1992). Qualitative Research for Education: An Introduction to Theory and Methods. (2nd ed.) Boston: Allyn and Bacon.
- Bullivant, B.M. (1990). Ethnographic Portrayal of Male Youth Culture in an Australian Inner City School. Curriculum Inquiry, 20 (3) 325-338.
- Burns, R. (1995). Introduction to Research Methods. Melbourne: Longman
- Carspecken, P., & Apple, M. (1992). Critical Qualitative Research: Theory, Methodology, and Practice. In LeCompte, M., Millroy, W., & Preissle, J. (Eds.). The Handbook of Qualitative Research in Education. (pp. 507-555). San Diego: Academic Press Inc.
- Campbell, M. (1988). An Educology of Culture: Implications for Teacher Education Reform from Contemporary Ethnographic Studies of Youth Cultures and Youth Subcultures. International Journal of Educology, 2 (1) 57-65
- Curriculum Council of Western Australia. (1998). Curriculum Framework. Osborne Park: Curriculum Council of Western Australia.
- Education Department of Western Australia. (1996). Education Statistics System: Technology and Enterprise Teaching Staff. Perth: EDWA.
- Education Department of Western Australia. (1998). Student Outcome Statements. Perth: EDWA.
- Fehring, H. (1986). Research Methodology in Education: A Critical Evaluation of Classical Experimental and Ethnographic Research in Educational Enquiry. The Educational Administrator, 26, 23-43.

- Fetterman, D. (1989). Ethnography Step by Step. Newbury Park: Sage Publications.
- Gleeson, P. (1994). Cultural Differences in Teachers' Work: An Ethnography. South Pacific Journal of Teacher Education, 22 (1) 5-18.
- Gradwell, J. (1996). Philosophical and Practical Differences in the Approaches Taken to Technology Education in England, France and the United States. International Journal of Technology and Design Education, 6 (3) 239-262.
- Gray, J. (1996). The Use of Section 20 of the Education Act 1928: The Study of a Contemporary issue using the Narrative Form. Unpublished Masters Thesis, Edith Cowan University, Perth, Western Australia.
- Hammersley, M., & Atkinson, P. (1995). Ethnography. London: Routledge.
- Hansen, R., & Froelich, M. (1994). Defining Technology and Technological Education: A Crisis, or Cause for Celebration. International Journal of Technology and Design Education, 4 (2) 179-207.
- Hansen, R. (1998). The Socialization of Technology Teachers: Two Unique Cases. Journal of Industrial Teacher Education, 35 (2) 29-40.
- Herschbach, D. (1996). "What is Past is Prologue": Industrial Arts and technology Education. The Journal of Technology Studies, 22 (1) 28-39.
- Herschbach, D. (1997). From Industrial Arts to Technology Education: The Search for Direction. The Journal of Technology Studies, 23 (1) 24-32.
- Hitchcock, G., & Hughes, L. (1995). Research and the Teacher: A Qualitative Introduction to School Based Research. (2nd rev. ed.) London: Routledge.
- Ihde, Don. (1997). The Structure of Technology Knowledge. International Journal of Technology and Design Education, 7 (1-2) 73-79.
- Jones, A. (1997). Recent Research in Learning Technological Concepts and Processes. International Journal of Technology and Design Education, 7 (12) 83-96.

- Kaplan, R. (1997). The Ends of the Earth: A Journey at the Dawn of the 21st Century. London: Papermac.
- Kenway, J. (1995). Masculinities in Schools: Under Siege, on the Defensive and Under Reconstruction. Discourse: Studies in the Politics of Education, 16 (1) 59-79
- Kimball, Richard. (1994). Tasks in Technology: An Analysis of Their Purposes and Effects. International Journal of Technology and Design Education, 4 (3) 241-256.
- LeCompte, Margret D., & Priessle, Judith. (1992). Towards an Ethnology of Student Life in Schools and Classrooms: Synthesizing the Qualitative Research Tradition. In LeCompte, M., Millroy, W., & Priessle, J. (Eds.). The Handbook of Qualitative Research in Education. (pp. 815-861). San Diego: Academic Press Inc.
- LeCompte, Margret D., & Priessle, Judith. (1993). Ethnography and Qualitative Design in Educational Research. (2nd ed.) London: Academic Press.
- Markert, L.R. (1996). Gender Related Success in Science and Technology. The Journal of Technology Studies, 22 (2) 21-29.
- McLaren, P. & Giarelli, J. (1995). Critical Theory and Educational Research. New York: State University of New York Press.
- Mottier, I. (1996). Issues and Implications. In Williams, J. & Williams, A. (Eds.), Technology Education for Teachers (pp.1-23). Melbourne: Macmillan Education Australia Pty Ltd.
- Murphy, P. & McCormick, R. (1997). Problem Solving in Science and Technology. Unpublished manuscript, The Open University, Milton Keynes.
- Olson, J. (1989). The importance of Ethnography for Educology: Towards Thicker Description of Teaching. International Journal of Educology 3 (2), 158-170.

- Schneider, B., & Lee, Y. (1990). A Model for Academic Success: The School and Home Environment of East Asian Students. Anthropology and Education Quarterly, 21 (4), 358-377.
- Schratz, M. (1993). Qualitative Voices in Educational Research. London: The Falmer Press.
- Schumacher, S. & McMillan, J. (1993). Research in Education: A Conceptual Introduction. (3rd ed.) New York: Harper Collins College Publishers.
- Scott, L., & Usher, R. (1996). Understanding Educational Research. London: Routledge.
- Spindler, George. (1982). Doing the Ethnography of Schooling: Educational Anthropology in Action. New York: Holt, Rinehart and Winston.
- Spindler, G, & Spindler, L. (1991). Reactions and Worries. Anthropology and Education Quarterly, 22 (1) 274-278.
- Spindler, G., & Spindler, L. (1993). Qualitative Voices in Educational Research. (Michael Schratz, editor) London: The Falmer Press.
- Turkel, S. (1972). Working. New York: Avon.
- Suarez-Orozco, M. (1991). Dialogue and the Transmission of Culture: The Spindlers and the Making of American Anthropology. Anthropology and Education Quarterly, 22 (?) 281-291.
- Sultana, R. (1995). Ethnography and the Politics of Absence. In McLaren, P. & Giarelli, J. (Eds.). Critical Theory and Educational Research. (pp113-127). New York: State University of New York Press.
- Thomas, J. (1993). Doing Critical Ethnography. Newbury Park, California: Sage Publications Inc.
- Wajcman, J. (1991). Feminism Confronts Technology. Cambridge: Polity Press.

Walsh, P. (1993). Education and Meaning: Philosophy in Practice. London: Cassell

Wicklein, R. & Hill, R.B. (1996). Navigating the Straits with Research or Opinion? Setting the Course for Technology Education. International Journal of Technology and Design Education, 6 (1) 31-34.

Wiersma, William. (1995). Research Methods in Education: An Introduction. (6th rev. ed.) Boston: Allyn and Bacon.

Williams, A. (1996). An Introduction to Technology Education. In Williams, J. & Williams, A. (Eds.), Technology Education for Teachers (pp.1-23). Melbourne: Macmillan Education Australia Pty Ltd.

Willis, P. (1977). Learning to Labour: How Working Class Kids get Working Class Jobs. New York: Columbia University Press.

Wolcott, Harry F. (1985). On Ethnographic Intent. Educational Administration Quarterly, 21 (3), 187-203.

Wolcott, Harry. F. (1988). Complementary Methods for Research in Education. (Richard M Jaeger, editor). Washington DC: American Educational Research Association.

Wolcott, Harry. F. (1990). Writing up Qualitative Research. Newbury Park, California: Sage Publications Inc.

Wolcott, Harry. F. (1991). Propriospect and the Acquisition of Culture. Anthropology and Education Quarterly, 22 (?) 251-273.

Woods, P. (1985). Field methods in the Study of Education. (Robert G Burgess. editor). London: The Falmer Press.

Woods, P. (1992). Symbolic Interactionism: Theory and Method. In LeCompte, M., Millroy, W., & Preissle, J. (Eds.). The Handbook of Qualitative Research in Education. (pp. 337-405). San Diego: Academic Press Inc.