

# Confronting Design and Technology Culture: Propositions for Development

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## ***Abstract***

*This paper proposes considerations for discussion, arising from a critical ethnographic study of a secondary Design and Technology classroom. The study examined elements of Design and Technology culture that may impede its future development. Discussed are recommendations, for both teacher training and school practice, which addresses the issues of a dominant masculine culture, the perceived status of Design and Technology and the implications of its genesis.*

## ***Introduction***

The recommendations addressed by this paper are derived from a critical ethnographic study into the culture of Design and Technology Education (Wellbourne-Wood, 1999). The study documented an ethnographic account of a Design and Technology classroom and identified significant aspects of this culture. The first stage of the study examined the predominant masculine culture within this learning area and the impact that this predominance has on various participants within the classroom. The second stage is an account of the perceptions of status attributed to Design and Technology compared with the more traditionally liberal pursuits within education. The final point looks at the impact of the historical genesis of Design and Technology on this culture.

The study identified and examined elements of Design and Technology culture. However, it is the intention of this paper to propose recommendations that may counter elements of this culture that stand to impede the development of Design and Technology in the future. This paper will introduce recommendations for consideration pertaining to each of these issues. What will be proposed throughout this paper are considerations for addressing the significant implications arising from elements of this culture, however, what is not proposed are specific strategies for implementing such recommendations. Whilst the situation of the study that these considerations were derived from was highly specific and contextualised, it is the aim of ethnography to seek the generic in the specific. Situations will undoubtedly vary in the embracing of such a culture, however, the validity of such considerations will exist on the basis that others will find the interpretation plausible and glean meaning and understanding from its analysis.

### ***Background to the study***

The impetus for this study stemmed from both a critical analysis of Design and Technology and an analysis of the past and proposed future of this subject area. As both a research methodology and a product of that research, ethnography was appropriate in terms of what this study hoped to achieve. 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 was 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.

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.

It is sometimes a bit difficult to work out which is the authors argument and which comes from the literature.

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 (Curriculum Council of Western Australia, 1998) 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 been interested primarily 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 the study. An unfamiliar outsider looks into a department and views the rows of machinery; an 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. These were all interesting cultural facets of this subject area and considered worthy of further investigation.

The intention of the study was to investigate this culture, to examine the features and characteristics and the routines and rituals that define this subject area. The aim was to establish a clearer understanding of the culture of a Design and Technology classroom, an understanding of the many contributing factors that influence this culture and the implications that this culture has in the classroom. The aim was to know and understand a little of the way of life in Design and Technology. A progressive step from this study is confronting this culture and recognising how various elements adversely impact the appropriate development of Design and Technology.

### ***A Predominant Masculine Culture***

The overarching component of Design and Technology culture identified by the study was a predominant masculine culture. This dominance was significantly evident through a distinct lack of women, both as teachers and learners. It was expressed through the types of artefacts that were produced, the learning environments, and the conceptions of Design and Technology that drive the curricula. Members of this culture acquire a certain competency with the routines and rituals that define it as masculine and few challenge it. There is an

identification and affinity with what makes it masculine and a distance from aspects perceived as feminine.

Significant implications arise from this distance. Not only does this distance maintain and perpetuate the masculine dominance of Design and Technology, but it also isolates various participants from access to its teaching and learning. 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.

The emerging redefinition of Design and Technology necessitates addressing the inequalities of this masculine dominance. They are inherited from the genesis of this learning area and have largely escaped various movements seeking equality reforms. The issues that must be addressed are complex and intertwined amongst the very culture that has engineered its position, and fights to maintain it. Several questions were raised throughout the study concerning this masculine dominance. Do girls feel they warrant equal rite of passage into Design and Technology? Do parents understand the benefits of its learning outcomes for their daughters? Do teachers consider it as necessary for girls to achieve competency in these outcomes as they do for boys? How does the broader socio-cultural context shape the perception of the girl's involvement? The question that must be addressed is whether Design and Technology can ever be considered to have a legitimate place in the curriculum if this dominance is not challenged? Can it survive amongst a continually changing conception of society and gender roles?

The following actions for considerations have been developed in response to the many perceptions that Design and technology is inequitably male dominant:

- Consideration 1      Developing collaboration between educational authorities, teacher training facilities and schools to increase the participation of women, both as teachers and learners in Design and Technology.
- Consideration 2      Identifying and eliminating curricula that are gender biased and designing curriculum structures that promote equal participation by girls and boys.
- Consideration 3      Redefining and redesigning learning environments that support the notion that Design and Technology is for men. This includes the symbols, language, space and ornamentation of environments.
- Consideration 4      Reflecting on the very conceptions of technology that construct our understandings of this learning area and evaluating the values, beliefs and principles of action and organisation that define Design and Technology.

The study identified all three factors: artefacts, environments and conceptions of design and technology as all pointing 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 girls participating in this study, so simply stated:

“It’s a boy subject” (Wellbourne-Wood, 1999, p.197).

### ***The Order of Merit: Design and Technology Status***

Throughout the 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. Both internal and external perceptions of Design and Technology were well represented throughout the study and these factors, in turn, had an impact in the classroom.

Internal and external perceptions of the place of Design and Technology within the school curriculum formed a significant aspect of this culture. Design and Technology remains, in many places, 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. These factors help shape an internal view of Design and Technology that is distanced from an egalitarian 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 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 cultural characteristics identified throughout the study, 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.

The paradox enveloping the position of status in Design and Technology makes any recommendations for its upgrading problematic. Whilst many pursue an egalitarian position

with the traditionally liberal pursuits within education, some view existing distinctions as a necessary separation that defines their place within the political and social life of the school. Some find refuge in the safety of these distinctions and consider change as an affront to their personal and professional identities. Upgrading the status of Design and Technology involves both inventing a realisation of the dignity involved in the work of Design and Technology and coming to terms with the responsibility that Design and Technology has towards the general education of all students.

The following actions for considerations have been developed in response to the issues concerning both internal and external perceptions of status in Design and Technology:

- Consideration 1** Continuing the development of Design and Technology curriculum as a relevant learning context for a broad range of diverse learning outcomes.
- Consideration 2** Exposing teachers, parents and school administrators to a diverse array of learning experiences undertaken by students, making explicit the rationale and outcomes achieved through learning.
- Consideration 3** Creating and seizing opportunities for collaboration with other learning areas
- Consideration 4** Making explicit to students; a rationale for their learning experiences, the expected outcomes to be achieved and relevant industry and commercial opportunities associated with their learning.
- Consideration 5** Seeking the inclusion of Design and Technology in post-compulsory review changes that place it in equal position concerning University entrance requirements.

### *The Historical Genesis of Design and Technology*

The final element of culture addressed by the study concerns the significance of the relationship between the predominant trades and labour history of Design and Technology staff and elements of teaching and learning. This history can be viewed as contributing, through its conception of technology, to the relationship with the students, as 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 throughout the study. This was expressed in teachers’ perception of their role as “trainer/educators”, their style of classroom management and the types of learning activities undertaken.

Many aspects of the master/apprentice relationship adopted by teachers contain conflicting pedagogy to that of a redefined Design and Technology. 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 learning area.

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 staff 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.

Throughout the study, many students, both boys and girls, 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 the teachers contributed 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 several students were interpreted as recalcitrance or rebellion, however, 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 several participants in the study, 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 the study restrict such possibilities.

The following actions for consideration were developed in response to the implications arising from the historical genesis of Design and Technology:

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| <b>Consideration 1</b> | Promoting an image of Design and Technology that reflects the breadth, diversity and possibilities associated with teaching and learning within this subject area. |
| <b>Consideration 2</b> | Facilitating professional development that will provide practitioners with support and strategies for adopting and embracing progressive curricula and pedagogies. |
| <b>Consideration 3</b> | Consider the expansion of studies in Design and Technology to more accurately represent its depth and breadth.   |

## *Summary*

As a subject area challenged by the complexity of change and human experience, analysing and interpreting the culture of Design and Technology 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 was 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. It was the intention of this paper to go beyond this and realise one of the goals of critical ethnography, which is to confront culture, to expose its injustice and inequalities. Critical ethnography examines the local context and meaning, as traditional ethnography does, but then confronts 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).*

Design and Technology is a dynamic and exciting context for learning. It provides both teachers and students with opportunities for creativity, imagination and innovation in learning. Its history has left a legacy of benefits for learning that should be embraced, with significant elements of Design and Technology culture providing dividends for quality learning. There are, however, elements of this culture that stand as barriers to the successful inclusion of all learners in the business of design and technology. It is for this reason that we should confront this culture, assess the potential harm of inaction and realise the possibilities

created through reforms. The considerations proposed throughout this paper are by no means exhaustive in terms of the issues confronting this emerging learning area. They do, however, represent an opportunity for growing Design and Technology into an equitable and progressive context for learning.

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