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Craft and Design

Do the skills used to create an artefact of qualitative uniqueness and quality by hand, increase ability in aspects of design?

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Order of Content

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Foreword

This essay is written primarily for students of design, and art and design education, who have the opportunity to include the learning of craft skills within their study programme. Its message however, could be of interest to anyone wishing to witness the preservation of those hand skills associated with traditional crafts. It attempts to argue the potential benefits of using 'crafts' as a supporting mechanism within art and design education. Explored is how the learning of hand skills in this context could be considered as a 'transferable competence'.

To this end, from 2008 to 2010 the researcher conducted interviews both structured and unstructured with many dozens of people: designers both in teaching and in industry; pupils of a craft secondary modern school; students training to be teachers of handwork in a university; and teachers of art. Salient points from these demographic groups will be discussed.

Hand skills are considered in this essay as one and the same with all skills involving the creation of a decorative or practical artefact of quality and originality by hand; this process will be referred to as crafts. 'By hand' has a variety of meanings; here, the implication does not exclude the use of electrically driven machinery, but the use of computer numerically controlled (CNC) machine tools or computer-aided manufacture (CAM) are considered to be outside this classification.

The word design is considered as a process. An aspect of this process is defining a problem or question prior to the conception and planning stages pertaining to a solution. It is hypothesised that tacit knowledge enables a more holistic way of viewing a design problem. It will be suggested that those with a craft skill are more likely to use and rely on intuition or automatic thinking when considering the ramifications connected with a solution.

Chapter 1 discusses a problem statement, relating to the value of crafts. It highlights how, over the last century, there has been a general shift in opinion as to their value and role in technologically developed societies of the world.
Chapter 2 uses a literature review to focus on where the ability to make subjective judgements is relevant to both aspects of craftwork and aspects of the design process.
Chapter 3 presents creativity as an umbrella under which technology, traditional craft skills and design sit together.
The example of Walter Gropius, founder of the Bauhaus School, will be discussed.
Chapter 4 expounds arguments in favour of partnering technology with creativity.

Chapter 1

Problem statement

The processes of industrialisation and the division of labour separated design from making (Julier, 1997). This, together with the results of globalisation, has altered how the education of hand skills is prioritised and has alienated people from the process of producing the objects they use. Craft apprenticeships of recent centuries, for example, previously involved a methodical process of educating young people in a craft, but these were disbanded in the early 1980's. For many in developed areas of the world, standardisation and ease of purchasing every-day products and a reduced profitability attached to handwork has affected how crafts are generally considered. Historically, life depended on the creation of objects by hand; this practice was intertwined with everyday life and every culture, not surprisingly, a fundamental urge in humans to create remains (Fiell and Fiell, 2006). Creativity underscores the value of working skilfully with the hands.

Based on tacit and explicit knowledge, the construction of objects is a process which, when used for personal, individual creativity, requires continual subjective judgement. The literature suggests that this process of exercising 'freedom of thought' is an aspect of human development (Cooley, 1991; Orr, 2002; Schumacher, 1973).

Polanyi (1958) adds to this argument when he asserts that by increasing 'tacit awareness' of the material world, a parallel greater understanding of self is achieved. He argues that this awareness is reached through the senses – by directly experiencing the materials humans use – working skilfully with the hands.

The learning and practising of hand skills are part of how humans developed and therefore their need to create is seated firmly in their psyche (Dickens, 1992; Sennett, 2008). Historically, education was developed for the purposes of supporting human life (ibid); it involved learning how to make, and use, tools and weapons, creating shelter, and harvesting and cooking food. This brought the need to educate this new knowledge through the generations – an emergent process grounded in the knowledge of 'crafting' available materials (Sennett, 2008).

Chapter 2

Literature review

2.1 Background to this chapter

Before studying design, the researcher worked for many years as a furniture maker, during which he observed that, essentially, the skill of carpentry and joinery is knowing how to remove the pieces which will reveal the desired section. The hypothesis of this work is that those with a greater degree of a craft based tacit knowledge have an increased ability to think through a process of (de)construction and would have a greater tendency to 'unwrap' a problem intuitively and with greater depth. Unpacking a design problem and removing the sections of material according to a plan are exercises separated perhaps most predominantly by the type of knowledge used in their processes.

In this chapter, two types of knowledge will be further discussed and will add reference to how explicit knowledge becomes tacit. The researcher recognises that the subject of tacit skill applies not only to crafts, but is also germane to other motor functions that involve the learning of a procedure which then becomes automatic; driving a car or tying one's shoelaces are examples. All such education contributes to equipping a mindset used to evaluate a problem.
This chapter will focus on how those who increase their tacit skills by learning aspects of a craft, simultaneously increase their evaluation skills.

2.2 Experience and tacit knowledge

Polanyi (1958) describes tacit skill as a 'tacit awareness' of connection with experience in a material world. He suggests that an expression of experience is the ability to judge subjectively. He explains that this ability places the individual within *their* reality and that tacit awareness *is* experience.

Polanyi further wrote in 1966 (p. 4): "We can know more than we can tell". He divides knowledge into two types; explicit or knowledge which can be codified and explained through language or diagrams, and tacit knowledge. Tacit knowledge, he argues, has an individual and personal quality derived from experience of action that engages the senses. He also suggests that areas of tacit awareness are innate and can also explain abilities such as inherited instinct associated with tradition.

Nonaka, best known for his books on knowledge management, explains how tacit and explicit knowledge can be differentiated (Nonaka and Krogh, 2009). He asserts that explicit knowledge lags behind tacit knowledge by explaining that it starts at a slower rate of cognitive development, but with repetition it gradually becomes tacit knowledge and automated.

2.3 Subjective judgement and perception

Dreyfus and Dreyfus (1986) describe in their book Mind over Machine, five stages of skill acquisition. They assert that the novice or unskilled person is likely to simply follow context free rules. Conversely, the expert or skilled person will be more confident to use intuitive subjective judgement and to rely less on rules. They also assert the experience of the expert has led to a tacit understanding and increased ability to grasp problems more holistically. Importantly, they claim that the expert will have a greater vision of what is possible and are more likely perceive uncertainty and critical intensity as a catalysing situation; stimulating a process that brings into focus a method that ultimately leads to an answer.

Wagner (2001) also argues that creativity is a process of discovery; a process of decision-making where the end results is unknown.

Schumacher (1973), Cooley (1991) and Rosenbrock (1977, cited in Cooley, 2007) argue that the making of subjective judgements is a reflection of the individual and therefore, in industry, motivates the worker. This is no new theory; Kierkegaard [1813-1855] also affirms that subjectivity reflects an individual's personality, determining their unique qualities, which enables individual identification to be separate but connected to all others (Howard and Hong, 1975).

According to Polanyi (1958), increasing experience of material through the senses results in an increasing ability to subjectively perceive a material world as an expression of the individual. The complex matter of 'experience' is beyond the scope of this work, nonetheless, briefly, Heidegger (1962) describes experience as *that,* which the beholder has interpreted consciously and which remains in the memory. In the following citation, Buber (1937) gives account of the subject-object relationship in order to highlight how experience and subjectivity are closely linked. He poetically describes a tree as a reflected expression of the beholder:

> *"I consider a tree.* […]
>
> *In all this the tree remains my object, occupies space and time, and has its nature and constitution.*

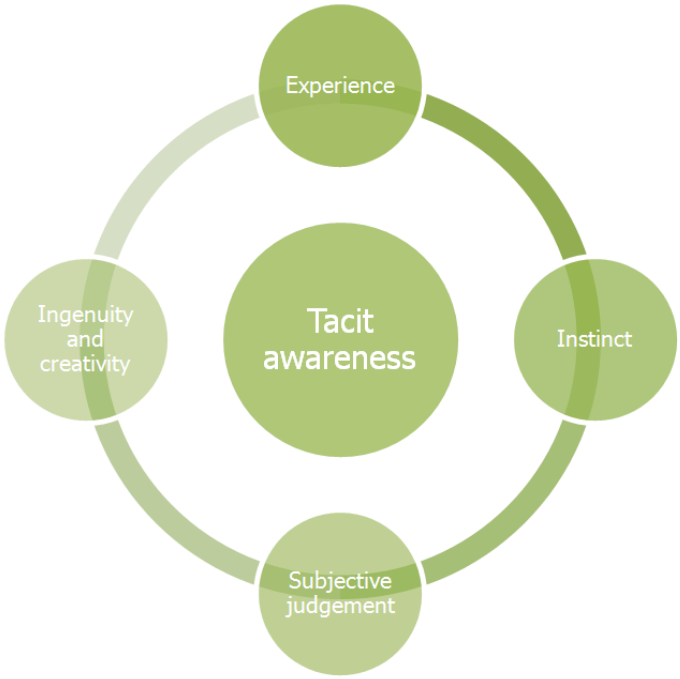
It can, however, also come about, if I have both will and grace that in considering the tree I become bound up in relation to it. The tree is now no longer it.[…]

To affect this it is not necessary for me to give up any of the ways in which I consider the tree. There is nothing from which I would have to turn my eyes away in order to see, and no knowledge that I would have to forget. Rather is everything, picture and movement, species and type, law and number indivisibly united in this event. Everything belonging to the tree is in this: its form and structure, its colours and chemical composition, its intercourse with the elements and with the stars, are all present in a single whole" (Buber, 1937, p. 14).

2.4 Chapter summary

This chapter has discussed theories put forward that interlink tacit knowledge with subjective judgement and faculties used for design. Figure A shows some of these relationships.

Figure A: Tacit knowledge relationships



Chapter 3

Combining design with 'crafts'

Around the sixteenth century, the word design, or its equivalent first appeared in the dictionaries of Europe (Cooley, 1991). These definitions did not suggest that design was a new activity, but that the processes pertaining to production could be defined and were divided as the conceptual and labour of the hand. This was the turning point that led to the design and doing differentiation – the separation of the work of the hand, *tacit knowledge* and brain, *explicit knowledge* (ibid).

Julier (1997) describes design as an "interdisciplinary expression of national, institutional or corporate aspirations" (p. 13). Nonetheless, he links design with culture, and argues that its definition is therefore in continual flux. Howard et al. (2008) argue that design represents the abilities of a society and show how the designer is much like the conductor of an orchestra by implementing a collection of necessary skills at the appropriate moment. Kimbell and Stables (2008) researched the thinking process of a designer suggesting that it could be differentiated from any 'ordinary' way of thinking.

Paul Guildford coined the modern usage of the word creativity in 1920 (Wagner, 2001). The in-depth meaning of creativity is beyond the scope of this essay; however, it may be helpful to observe that those who have made such a study describe it as a process. Wagner (ibid) subdivides this process into various phases of development. He argues that initially the creative process is a spontaneous sensually expressed reaction. He likens this to the way children create. The phase of forming a goal-oriented direction, he argues, depends on the creator's subjective evaluation of the problem.

Nevertheless, Cooley (1991) asserts creativity is more than a subtle process. He argues that creative people have an open-ended childlike curiosity and above all an original approach to problems.

This chapter will argue that obtaining skills that lead to craft competence are relevant to the processing of the *'spirit of enquiry'* and therefore valuable to the designer or artist.

The researcher asked a number of *teachers of art* who had taken a craft course, to talk about their perspectives regarding the benefits attached to working skilfully with the hands. Many gave answers pointing toward the value of crafts in education. Some described how it is through the action of 'doing' that a greater understanding of culture and an empathic attitude towards its traditions is achieved. Konrad and Traub (2009), known for their research into the

learning process, argue that 'doing' is the material basis of self-recognition, which leads to the understanding of one's identity as part of a society, along with its traditions.

Teachers of crafts with whom the researcher spoke, described hand skills as a necessary tool, which can be used today by those in industry, such as architects, technical engineers or product designers, where they are required to make models.
The concept of using crafts as a method with which to advance an objective beyond the production of an artefact, the researcher found to be common to both groups of teachers.

Some influential designers of the 20th century present this as no new way of thinking. British designers such as Tom Dixon or Ron Arad worked their designs largely by hand toward either a prototype or one-off object (Julier, 1997). From interviews conducted with industrial designers, the researcher gathered that some manufacturers in Italy are today hand crafting one-off elegant pieces of furniture. Once complete they use reverse engineering techniques to produce them in larger numbers.
The transmission from idea to a finished hand-made article requires a designer to consider a vast variety of relevant elements. It is therefore argued that working material by hand increases comprehension in respect of the parameters of the project.

3.1 Technology vs. traditional crafts

Walter Gropius founded the Bauhaus in 1919 (Fiell and Fiell, 2006). He attempted to reconcile the social idealism of a craft-based society with commercial reality (ibid). He argued the economic viability of perpetuating the craft mode while concurrently embracing the use of machines designed to produce en masse (Julier, 1997). Gropius, who employed staff from widely differing ideological standpoints, used his workshops as a platform for educational experimentation. He investigated how the process of handwork could contribute to the production of objects of serial manufacture (ibid). He encouraged his students to study the intrinsic qualities of material and make inventive constructions from *objets trouvés* (Fiell and Fiell, 2006, p. 39).

Gropius argued that those who were skilful at working material by hand enjoyed greater ability in understanding the limits and possibilities of design. He contended that continuing traditional handwork was a method of gaining skills invaluable to the industrial designer* (Julier, 1997). Gropius firmly linked the artist with the craftsman and although the two never became synonymous with each other, the influence of the Bauhaus helped to elevate the perception of the value of the craftsmen, who according to Gropius, 'could breathe life into the soulless machine' (ibid).

* Described by the Bauhaus as an 'industrial artist'

Although in the late twenties the Bauhaus moved towards fully automated methods of production, the Directors did not abandon their ideal of combining the crafts with the work of designers (Fiell and Fiell, 2006). Cutting short their experimentation in this respect, the Bauhaus closed in Europe in the 1930's for political reasons. Nonetheless, the success and influence of their work provides an argument for continued research in this context.

Chapter 4

Technology and creativity

Discussed in the literature review were those linking individual identity with the faculty to make subjective judgements. In the foregoing chapter it was argued that this ability could be trained through using skills pertaining to the crafts as part of the design process, which increases competence in unravelling a design problem.

In this chapter, it is argued that increasing a tacit knowledge in a craft decreases reliance on technology and in so doing increases 'creative interaction'. Emotion, an aspect of the creative process (Wagner, 2001), will be linked to the ability to make contextual subjective judgements.

Cooley (2007) affirms that Western culture has led people to conform to the conception that calculation is apolitical, analytical and scientific. Orr (1992) argues that modern society is conditioned to look to technology for a 'quick fix' for every problem. Csikszentmihalyi (1996, cited in Kimbell and Stables, 2008) states, "Creativity is a central source of meaning in our lives […] Most of the things that are interesting, important and human are the results of creativity." (p. 14). Cooley contends that creativity is society's most valuable asset, which governments of Western countries are, in general, wasting by relying less on the creative process and more on technology for instant solutions. He does not dispute that the development of technology is creativity, but argues for a balance in its use; he states that: "*Decision-making is probably at its best when there is a creative interaction between judgement and calculation*" (p. 5).

Feenberg (1999) suggests that technology is now so intertwined with the whole of society that any significant change in electronic media affects most aspects of society such as religious, cultural and political. In a more recent paper (2008) he asserts that technology has altered the accepted model of human evolution and argues that the extent to which technology is considered separate from social influences is significantly exaggerated; he affirms that they should not be considered separate at all and are in fact interrelated.

Cooley (2007) supports this viewpoint by asserting that current belief in technology is such that propositional knowledge based on analysis and calculation has become more significant than tacit knowledge. This, he argues, has resulted in the perception that "know that" is more important than "know how". He adds that a "*symbiosis of the two and a creative interaction of them is essential*" (p. 8).

In 1986, Esprit 1217, a major six nation EEC project demonstrated how humans' skills can be used in computer-aided manufacture if the supporting software requires continual human interaction, this it was found created a human/machine symbiosis (Cooley, 1995). The research project demonstrated that '*human centred'* computer integrated manufacturing (CIM) can be an efficient method of production. It enables the use of skills and experience, which stimulates and motivates the worker. It demonstrated that craft skills are relevant where methods of serial production are employed and can be integrated into computer-aided manufacture (ibid).

4.1 Emotion and design

Experience, judgement and perception have been discussed as essential for the processes of design. Heidegger (1962) describes emotion as part of consciousness, composed of the facet of awareness or ability to experience or perceive subjectively. He argues that the object *is* what is reflected in the conscious perception of the beholder. It could therefore be assumed that emotion is an individual and personally unique driving force, which can connect the intellect with that of which the intellect is not always aware. He likens emotion to perception and judgement.

Polanyi (1958) makes the point that using emotion in design is taking the safer route and is liable to bring more desirable results. He contends that pure 'rational' objective judgement is constrained because it is likely to lead to conclusions that are mechanical in nature and therefore limited by the quantitative information available.

Cross, in 1999, conducted research into how artificial or technological thinking could be compared with natural or emotional intelligence. The results showed that that which is based purely on 'mechanical efficiency' is not able to consider interconnectivity because the process used has no sentient ability. He provides a hypothetical example of a robot conducting an operation during which the patient dies, and is judged by the computer as a total success.

To conclude this chapter: The value and necessity of combining: the objective with the subjective; rational thinking with emotional thinking; explicit knowledge with tacit knowledge; and technology with handwork, has been discussed. Creativity has been suggested as a method by which these connections may be realised.

Conclusion

Historically, the survival of humans has depended on the skilful construction of essential objects by hand. Crafts, in this respect, were indispensable. They are however, in developed countries, no longer considered in this manner.

Could craft based hand skills again be considered to be essential in societies that are largely reliant on methods of serial production?

A growing world population is sustained through innovating systems of production. Through defining how available resources may best serve this purpose, designers are charged with designing products which can be made with the use of automated machinery.

If it can be shown, through appropriate, relevant research, that aspects of the faculties designers use to convey their intuitive reckoning of the solutions that are needed can actually be strengthened by increased craft based skills, then the argument put forward that crafts can no longer have part within modern methods of production must surely be regarded as untrue.

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