

# We Feel Therefore We Learn: The location of emotion in the creative and learning experience (Part 1).

Paper adapted from the Keynote presented on 5 July at the Design and Technology Association Education and International Research Conference 2007 University of Wolverhampton, Telford.

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## Abstract

This paper, in two parts, offers a broad overview of new opportunities for considering the location of emotion within a creative, learning and product orientated design and technology experience. The paper builds upon the author's previous work and considers the location of emotion in three fluid domains: Person, Process and Product.

The paper argues that for truly creative, engaging learning experience, the location of emotion is central but, more importantly, understanding the relationship of emotion to our decisions making offers greater opportunities for our future creative development.

## Key words

creativity, emotion, design and technology, perception

## Introduction

This paper is adapted from the research keynote: We Feel Therefore We Learn, presented at the D&T Association Education and International Research Conference 2007. The paper is being presented two parts with part two appearing in the next edition (Issue 13.1). In this paper I am going to give a broad overview of the field of emotion as well as being speculative, provocative and hopefully informative, whilst the second paper will look more specifically at the domains of emotion within the creative process.

Before exploring the broad concept of emotion I want to indulge a little by taking the opportunity afforded by a keynote to reflect upon two key areas. In my first reflection I want to consider our subject from a personal perspective. In essence I have grown up with Design and Technology and believe it to be the most important subject on the curriculum. I have an emotional attachment to it, it has been good to me and I hope I have given something back and can continue to do so. But I think we have all got to the point where we both need to recognise that we are no longer teenagers. We have grown up and as such we need to recognise this, as for some time the

subject can be considered to have lived with one foot in a nostalgic past by creating narratives about what it was like in the good old days whilst at the same time making excuses for the subject as it remained the baby of the curriculum.

So it's time to mature – deliver what we say we can deliver and if we do then the benefits are significant and the beneficiaries numerous. Nothing I have read in the last 20 years has changed my opinion that Design and Technology (D&T) offers a unique way of learning and of empowering children. The ability to be able to be creative, to deal with risk, to manage uncertainty and to take action in the designed and made world has never been more essential in a world of increasing uncertainties and complexity. But creative thinking remains the antithesis of the embellished trinket, food and apparel production that appears to have predicated the subject. Such practices are the exact opposite of designerly practice. For some reason there remains a legitimisation of practice where pupils are expected to suspend their belief and values systems as they enter the sweat shop mentality of D&T in the production of inconsequential memorabilia. The subject is too important to be trading in such practices. Whether it be through sustainable, political, theological, technological, global, economic or ethical agendas there has to be an emotional, creative and intellectual challenge which employs informed decision making processes and which promotes an understanding of and responsibility for the resultant implications of any action taking. We have sufficiently rehearsed the potential of the subject whilst in its infancy, but now it has to be delivered.

My second reflection refers to our research community which is slowly growing and maturing. In the last seven months I have attended research conferences in Brisbane, Chicago, Glasgow and last but not least Wolverhampton and believe there is an increasing acceptance for the intellectualisation for the

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subject and what appears to be an increased dynamic. As John Williams (2007) indicated in his recent think piece in the Design and Technology education journal; the boundaries are being pushed into new areas including emotion, environment, experience, values, technicity, democracy and rights. These of course build upon the existing research but also offer a way forward for new researchers.

My only concern is the lack of new researchers and new faces at this conference and this may be in part down to the difficult path that new researchers face. The path of the researcher is an emotional one dealing with significant uncertainties and vulnerability as your work is scrutinised, often in high stakes contexts, which increases a sense of vulnerability for what appears to be little reward. However, engaging in research is a rich, powerful and rewarding experience, dare I say a professional responsibility, but we do need to maintain a critical mass.

You may recognise that I have deliberately portrayed the subject as a living, breathing entity to both help characterise and engage our emotional capacities whilst reinforcing that this is an activity system worth nurturing rather than stifling. I truly believe that this subject offers more than other subjects and I have some, but not complete, certainty of this but evidence shows how communities whether they be related to religion or gambling have an emotional engagement with their beliefs and those beliefs are what sustain us. As Stephen Petrina (2006) recently indicated:

*Commentators on our times note that we – the masses – are lost, again searching for something. Whether it stems from alienation, disenchantment, secularism or a fear that does not yet have a name, there is restlessness, a thirst for meaning and purpose and turn to spirituality and religion. Salvation in shopping, surfing, and browsing is not entirely satisfying (p337).*

Perhaps D&T is therefore our religion or our opium? Going back to the role of the researcher it is worth reflecting for a moment how researchers remain part of a community whilst also questioning that community—the essence of action research – this requires different types of emotion to come into play as doubt motivates enquiry whilst certainty freezes

enquiry. The reality is that research offers the alternative to blind faith and I can certainly recommend it.

As previously indicated the title of this paper is 'We Feel Therefore We Learn' and to this I want to add some questions which I will explore throughout the two papers. These include:

- What are emotions and how reliable are they?
- Can we trust our emotions and use them to guide our thinking?
- How do our emotions influence our decision making?
- What is the relationship between creativity and emotion?

The starting point for this discussion is my conviction that emotion is central to our ontological and epistemological beliefs. As such we are driven by our emotions and therefore we have to be able to understand our emotions as well as being able to utilize and critique them. Finally I will propose that creativity offers an opportunity to evolve our capacity to override what may be a lack of autonomy in our sub-conscious processing and emotions.

## Perception

So what are we feeling at this moment – the truth is, consciously, not a lot but before this is explored further I want to draw a brief distinction between feelings and emotion as I am going to use the terms interchangeably whilst acknowledging that they are different.

Feelings can be considered as the residue of our emotions in that they are what we respond to and can revisit – feelings can be regarded as the warning systems whilst emotions are the sensors. So how reliable are our feelings as a guide? Table 1 (William, 2006) shows how our perceptions, related to our feelings, lag behind reality. Take any moment – if your brain actually started to consciously process everything it has access to it would simply be overloaded by the sheer quantity of information—therefore a filter system operates which defaults to a survival state – we are in effect operating on standby.

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Sensory system	Total bandwidth (in bits/second)	Conscious bandwidth (in bits/second)
Eyes	10,000,000	40
Ears	100,000	30
Skin	1,000,000	5
Taste	1,000	1
Smell	100,000	1

*Table 1. Information flow in sensory systems and conscious perception*

William describes how only a minuscule proportion of the sensory data processed by the unconscious mind, capable of processing approximately 11 million bits per second, is referred to the conscious mind (capable of processing approximately 50 bits per second). We are therefore potentially only receiving 1/200,000 of what is actually being processed by some of our senses and as such our perception of reality are merely highly filtered experiences. William also highlights that conscious awareness of stimuli from the environment lags behind actual perception by approximately half a second, but that a backward referral of subjective experience results in an individual's perception of the stimulus and its conscious awareness as simultaneous. This is mind blowing stuff as what I am saying is lagging somewhere in our mind with our conscious mind taking up any appearance of any slack – the sensation of when you look at the seconds hand on your watch and it seems to be hanging still is said to exemplify this. Such realities can be slightly destabilising, particularly when we base our whole existence on what we believe are realities when in fact our perceptions of reality may not always be what they appear to be.

'Traditional models of affect' (Williams, 2006:74) have proposed that such information is processed consciously and then referred for an affective reaction with the belief being that we decide what we think, and then we decide how we feel about it. Evidence provided by Damasio (1994) in his paper 'Descartes' error' is that the real order of things is likely to be the

opposite of this as he suggests that the 'subconscious processing that occurs prior to referral to consciousness invests the sense data with affect before referral to consciousness' (William, 2006:74). Therefore what we feel about something may inform us what we think. Such understanding makes the term 'thinking about it made me feel...' slightly redundant. As actually feeling it made you think about it.

Whilst discussing language, although not the focus of this paper – I want to acknowledge the significant way that emotions are both mediated by and embedded in our language and that the influence of language, as evidenced through activities such as neuro-linguistic programming, works on our emotions in very subtle ways. It is also worth considering the attachment and additional value that is given to everyday emotive language such as 'speaking from the heart', 'my gut feeling is' or 'I felt touched by'. Later on I will discuss this context further and show that what we feel may not always be the best guide for our cognitive development or be in our best interests.

Returning back to the subconscious processing of information and feelings – do you ever get that sensation that you recognise a face. Chances are you will be right. Image recall experiments have consistently shown our ability to subconsciously store and access information that goes way beyond that which we would try to process in normal ways (such as using traditional memory techniques). Shepherd

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(1967), showed participants 2,560 images over several days and when asked to recall which images they had and had not seen achieved 90 percent success rate. In a second experiment (Higbee, 2006) participants were shown 10,000 images and words but could both remember and recognise pictures more easily than words. After seeing images just once, they remembered pictures with significant accuracy for as long as three months (2001: 64–78). It is speculated that human beings may have an almost unlimited capacity to remember pictures which adds credence to Aristotle's 'the soul never thinks without a picture'. Such image based sub-processing offers interesting questions about how designers recall and manipulate images in the mind and the extent to which this is a conscious process.

However what we see or feel isn't always as reliable as we feel or think. The Müller-Lyer illusion is a familiar optical illusion where we all know that the two lines are the same length but what we process through our visual system is something different.

Gregory and Harris (1975) suggests that the Müller-Lyer illusion is caused by the visual processing system creating the perception of the internal corner as larger, as in traditional rectilinear environments it must as a consequence be further away. Indeed, it has been found by Deregowsky (as cited in William, 2006) that people raised in cultures that do not build rectilinear structures do not experience the Müller-Lyer illusion. Even something as basic as what we see, therefore,

is not 'transparent', but instead we are receiving a manipulated perception in this case something being added.

This is the equivalent of the rational/emotional dualism and is a 'systematically defective emotional response' (Deonna, 2006) similar to irrational phobias which although we recognise them to have little foundation (as in we know the lines are the same length) result from peculiarities or damage to specific emotional systems. For example 'hippopotomonstrosesquippedaliophobia' is a persistent, abnormal, and unwarranted fear of long words whilst 'phobophobia' – is a fear of phobias. The reality is although our phobias may be apparent, whilst also recognised as irrational, our subconscious irrationalities influencing what we see, feel (as part of our emotions) and think may not be quite so obvious.

Aglioti (*et al.*, 1995) recreated a similar illusion to the Müller-Lyer illusion known as Ebbinghaus circles illusion (Figure 2) where participants see two identical discs presented side-by-side. One disc is surrounded by a set of small circles while the other disc is surrounded by large circles. Consistently participants report that the disc in the middle of the large circle looks smaller than the disc surrounded by small circles. However when created physically although the illusion remains the participants use exactly the same finger separation to pick up either of the discs. 'Their action system is immune to the illusion' (*ibid*).

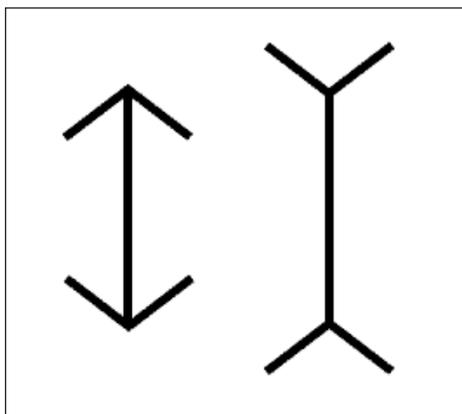


Figure 1. Müller-Lyer illusion.

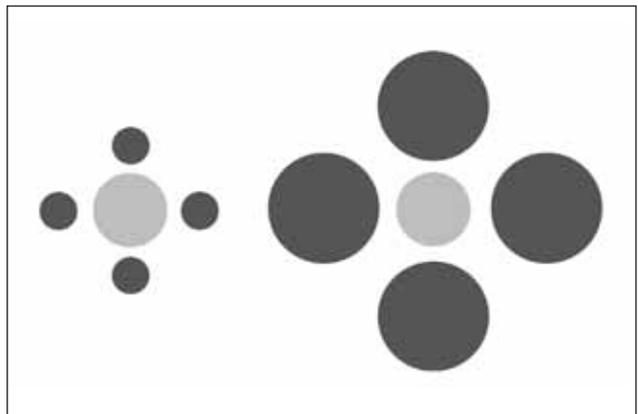
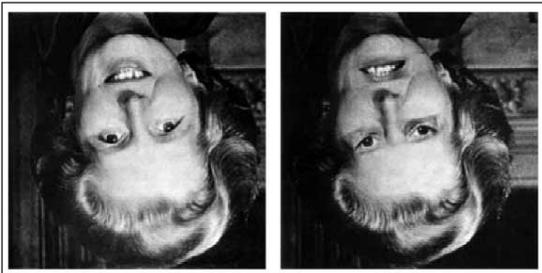


Figure 2. Ebbinghaus circles illusion.

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This indicates that these illusions only affect perception but not grasping and as such deceive the eye but not the hand. Within the context of this presentation this reinforces that our autonomous control system (as part of our emotions) are making a whole range of compensations that we are not even aware of and in this simple example of visual illusions deceive the conscious, but not the subconscious operations of our mind.

Therefore our emotions and feelings – as part of our subconscious processing – can significantly manipulate our perceptions of what we feel, see, touch and see and I guess these are all pretty important features of teaching Design and Technology and are worth gaining an insight into. To add to this a little further, in the Müller-Lyer illusion we can see how information is being added to what we see. However in Peter Thompson's Margaret Thatcher illusion (Figure 3) we can see how our sub processing autonomous feelings are letting us down by not alerting us to something that is clearly wrong as when looking at the image upside down our processing system is indicating that most features are in the right place so everything must be okay.



*Figure 3. Peter Thompson's illusion of Margaret Thatcher*

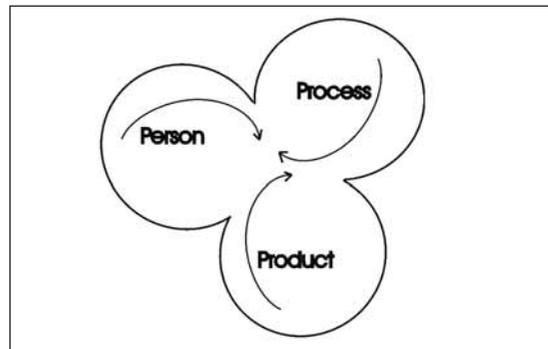
When viewed the other way however it illustrates that our perceptions only work at a certain level and are adjusting our thinking so that they are only partially reliable as what you see may not be the reality (the brain filtering in or out information). In truth we fly through life on autopilot and rely upon our emotions and feelings to alert us when something is not quite right. Such reliance is fine in reproducing the world based upon previous experiences as such 'heuristics' provide the mental shortcuts that enable reasonable accurate fast and efficient judgements based upon

survival. However the weakness arises when we are using these experiences to inform our decision making process or when involved in cognitive development activities.

Interest in how our autonomous systems and emotions operate is however nothing new and the concept of Aristotle's 'pathos' place emotion as central to persuasion. Aristotle characterised the social groups such as the elderly, and the wealthy and the emotions that work well to persuade them particularly in the concept as an audience or when delivering political agendas – something that is all too apparent in today's politics.

### Triadic Schema

Having discussed the very broad context in which this discussion is located, I now want to focus more specifically on the areas of emotion that has initially informed my work. Several years ago I first presented the concept of emotion residing in three areas in Design and Technology (Spendlove & Hopper 2005). The central tenet of the work was the location of emotion in three distinct interrelated areas linked to the person, the process of learning and the products that both surround them and the products they produce. This work has been developed and refined and recent papers (Spendlove 2006a, 2006b, 2007a, 2007b) have looked at applying the triadic schema (figure 4) in other creative subjects. The work, informed by significant literature, proposes that to achieve a creative, engaging, learning and product orientated experience there has to be an investment in each emotional domain of the schema.



*Figure 4. Triadic schema for locating emotion in person, process and product domains.*

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For the purpose of this keynote I want to explore the domains of the schema further and draw upon a wider variety of areas such as philosophy, neuroscience, critical theory and pedagogy from the fields of emotion, creativity, learning and design. The simplified conceptual map (Figure 5) illustrates my particular take on the topic and I am aware that what I am presenting is a synthesis of my thinking. In essence it is an interpretive phenomenological analysis to examine what is a potentially complex theme.

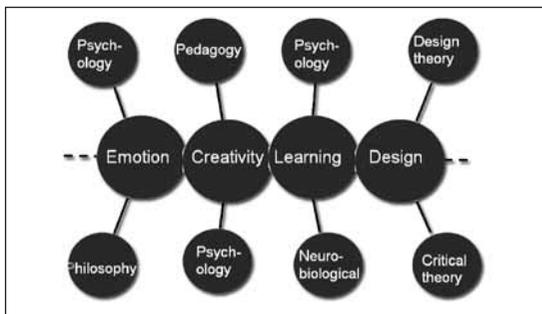


Figure 5. Conceptual map for exploring triadic schema.

## Emotion

Stephen Petrino (2006) in a paper on theology stated that too often in design and technology education we emphasize and prioritize technical-empirical, or rational values, over equally important existential-spiritual, ecological-natural, ethical-personal and socio-political values. Or, we leave the technical-empirical values unchecked. In effect, we are out of balance. To this I want to add emotion in a broad context.

As in many complex topics there are many definitions of emotions (over 90 in the psychological literature alone) and for now I will adopt that of Salovey and Mayers well regarded definition:

*Organised responses, crossing the boundaries of many psychological subsystems, including the physiological, cognitive, motivational and experiential systems. Emotions typically arise in response to an event, either internal or external, that has positively or negatively valenced meaning for the individual.*

(2004: 2)

Essentially this identifies that emotions are messy, natural, primitive and often difficult to define yet they provide us with a reflexive ordinance system which influences our behaviour, decision making and creative thinking. They guide us on which side of the road to walk on, whether to cross a road to engage with a stranger, who to speak to at a conference and whether to attend a keynote at an international research conference (or not). We are ultimately driven by instincts. Emotions are however unlearned reactions to triggers or stimulus generating physical changes required for our survival and well being through the deployment of different emotions to situations. Ultimately they are adjustable and adaptable, elaborated by culture such as through the concepts of ethics, values, education, laws and judicial systems. As an area of academic study emotion has largely in last century been neglected but interest in the last decade has been regenerated with advances in neurobiology, and re-emergence of interest in the philosophical grounding of emotion. Most recently, interest has been captured by Goleman's (2005) popularised emotional intelligence (which some might consider an oxymoron) theories. A misconception within this construct is that feelings generate the emotions when it is the emotion that generates the feelings. As such we tend to use the terms emotion and feelings interchangeably as clearly there is an association however, it is generally considered that there are six basic emotions in all cultures: happiness, sadness, surprise, disgust, anger, and fear. Such emotions are our primary response mechanisms, they are built into our DNA and are chemical neurobiological responses to a variety of stimuli.

Feelings meanwhile can be considered as the residue of our emotions. When we reflect upon an event it is likely that we can associate with the feelings more so than with the emotion as feelings are a subset of all of our mind-body states such as disappointment, hunger, hope, etc. There are hundreds of them and culturally we react with different feelings to different emotions in different cultures. Therefore feelings become a learned response in the culture in which you are nurtured (the family, the peers, the community, etc) and are the warning system for the emotion that stops us from attempting to revisit that emotion. These emotions are what direct our attention and are the drivers of our cognitive attention.

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Popular psychology draws our attention to this driver through the 'fight or flight' scenario (I feel before I think) and most will be able to locate the amygdala as the controlling part of the brain in this situation. The amygdala tends to be referred to as storehouse of the reptilian 'old brain' with innate memory as its early warning system which takes around seven milliseconds for these warning signals to transmit to the thalamus and a few milliseconds further for the thalamus to relay them to the amygdala. Goleman (2005) has described this as 'Hijacking of the Amygdala,' as the thalamus can quickly react to potential threat. In such cases it bypasses the cortex (conscious processing) and sends the signal straight to the amygdala which reacts based on previously stored patterns.

The truth is we are often reacting without fully having time to cognate or see what we are reacting to. Ever opened a cupboard and caught something falling out without ever really seeing it? Ever done it the dark? The reality is that we are reacting in a similar subconscious autonomous way all the time and if we were ever able to compute all the senses that we have managed to suppress then our mind's thinking would collapse under sheer mass of information.

As previously indicated Goleman's synthesised work resulted in the popularisation of emotion through the term 'emotional intelligence' and this has characterised a resurgence of interest in the powerful concept of emotion in current educational practice. This upsurge in attention to emotion is now evolving into policy with the Department for Education and Skills (DfES now DCSF) placing emotional wellbeing at the heart of the Every Child Matters and SEAL (Social and Emotional Aspects of Learning) programmes. Much of this enthusiasm stems from the anticipated gains in increased inclusion, pupil learning and ultimately leading to greater social cohesion. Such aims are firmly based upon the 1950s socio-emotional learning movement, stemming from the work of humanistic psychologists such as Maslow and Rogers, and can be seen as a reaction to the 'rational technicism' of the government reforms of the 1980s and 1990s. To further illustrate the potential interest and marketing capacity of emotion; Anthony Seldon, headmaster at Wellington independent school charging approximately £24,000 a year, has

introduced emotional well being classes as an antidote to the pressures of modern day education. Finally, the fact that I was invited to present this paper is testament to the interest that surrounds the concept of emotion within education.

Current theories of emotion however promote the concept of emotional ambivalence and the notion that we have become desensitised to some of our emotions. For example in the United States it is calculated that the number of murders seen on television by the time an average child finishes elementary school is 8,000, whilst the number of violent acts seen on television by age 18 is approximately 200,000. The number of 30-second television commercials seen in a year by an average child is 20,000. Whilst considering these figures it is also important to remember that these are not just casual engagements with ad hoc material. This material is precise, calculated and powerfully driven to have a maximum emotional impact upon the viewer. Such modern day bombardment with images, sounds and products create a constant search for stimulation and distraction to prevent the 'quieting of our minds' thus not allowing reflection and as a consequence the emotional 'space' in our life has been resigned to that of an inconvenience. Beyond school, the concept of emotional development is made all the more urgent by what Mestrovic (1997) describes as the post-emotional society which proffers a "new hybrid of intellectualized, mechanical, mass produced emotions [that] has appeared on the world scene" and which results in pre-packaged, manufactured emotions – a "happy meal" or the 'McDonaldization of emotions' consumed by the masses" (*ibid.*: xi). Mestrovic reflects that in previous generations, society would react to events with either deep emotional empathy or antipathy, however in today's post-emotional society they respond with ambivalence and intellectual rationalization creating a lack of engagement and which tends towards a superficial existence.

### Emotional manipulation

As we are generally steered by our emotions the way our emotions are externally manipulated is open to question and examination. For instance the current (July, 2007) home office threat of terrorist attack is rated as severe and was only recently reduced from

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critical, the highest level from where it can go no higher. If you asked most people today what the biggest threat to them was then terrorism would possibly be on their list with the likelihood it would be high on their list. This is not an attempt to diminish what are causes for concern, particularly in the context of recent events, however you are significantly more likely to do damage to yourself in your own home or whilst being treated in a hospital than through what any terrorist is likely to do to you. Terrorism thrives on fear and plays on our emotions.

In 1999 national statistics indicated that there were 200,000 DIY injuries in the UK and 70 deaths. There were 2,506 accidents with power drills; 1,920 accidents with circular saws and 622 with chainsaws. Way beyond any form of terrorist attack. Fear of strangers is another fear most of us have – it is an emotionally driven anxiety – yet you are statistically more likely to be killed by a member of your family than a stranger.

Road traffic accidents remain the principal cause of accidental death and injury across the whole population. In 1997, 3,559 people were killed, 42,967 were seriously injured and 280,978 were slightly injured in road traffic accidents.

Every year approximately 1,500 car drivers and adult passengers die in road accidents and 1,000 pedestrians and cyclists are killed and 40,000 are injured. Each year in England nearly 180 children die and almost 4,800 are injured as pedestrians or cyclists. Many are killed when playing or walking close to their own homes. Over 3,000 people aged over 65 years are killed annually in falls. The home is also the setting for serious accidents to children from a variety of causes such as fires, burns, drowning, choking, poisoning and cuts from sharp objects. Around half of all deaths among children under five happen in the home.

So our fears are disproportionate to the symptoms. A war on terror may be convenient from a government and media perspective, fuelled and driven by our emotions, whilst a war on stepladders, driving and DIY may not have the same resonance.

Adams (2005) quotes the death toll from the London bombings three years ago represent just six days of death on Britain's roads. The death toll from the

Madrid bombings represents merely twelve or thirteen days of death on the Spanish roads. In the 25 'busiest' years of 'the troubles' in Northern Ireland twice as many people died in road accidents as were killed by terrorists whilst it is estimated that last year more than 1.2 million people were killed in road accidents globally, the equivalent to more than one 9/11 every day. Yet the public fear of terrorism – and their emotionally driven reaction to it – is on a completely different scale to that of death on the road. Adams asks why do thousands not gather weekly in Trafalgar Square to manifest their collective concern?

Adams further extends the paradox. In 2003, worldwide, 23 Americans were killed by acts of terrorism (compared with 25 in 2002 and about 2800 in 2001). In each of these years about 42,000 were killed on American roads and yet the resources devoted to countering terrorism continue to increase whilst the revoking of traditional civil liberties continues apace. As an irony and indicator of how our emotions may not always be the best guide, post 9/11 there was an increase in traffic fatalities as people opted to travel by car rather than by aeroplane. As goes the familiar statistic that is quoted to anyone who has the emotionally driven fear of flying – you are more likely to die on the way to the airport than in the air.

Adams asks why does violent crime have greater resonance than obesity and clogged arteries? Why do we fear weapons of terror over global climate change? One emerging theory is that our emotions have failed to evolve sufficiently. We have prehistoric emotions in a technological world and as such we fear that which we have been prepared to fear – such as being confined in a tight space whilst flying at 20,000ft whilst also we fear strangers outside our own tribe who may do us harm.

Therefore our emotions both manipulate and influence our thinking and decision making. They impact upon our subconscious and judgements, feed our superstitions and make the disproportionate proportionate. They thrive through on our dependency and provide a difficult cycle to break, one we wouldn't want to tempt fate against – touch wood! We therefore need to be critical of how our emotions influence our everyday decision making

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processes and actions as decisions are often based upon the potential for giving that emotion a generative influence. If we consider this further, McPhail (2004) identifies emotions as being central to an individual's ability to establish which problems they should solve and in which order they should address them, being aware that emotions act as filter that directs our attention and becomes a reflexive ordinance system.

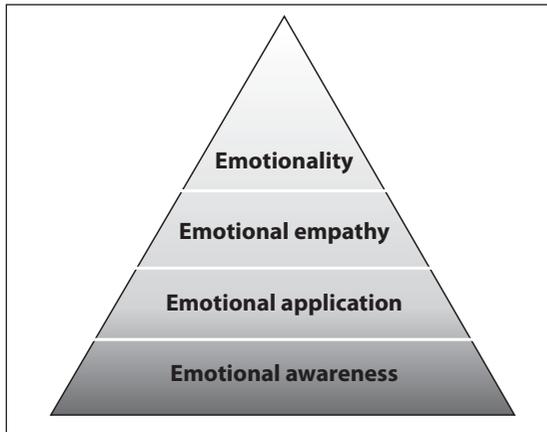


Figure 6. McPhail's level of emotional awareness.

If we consider the top two tiers of McPhail's levels of emotional awareness then I would suggest emotional empathy and emotionality are at the very heart of what we are attempting to do in education. That is, firstly nurture emotional empathy, as in the ability to understand others people's emotions and how we impact upon them with our decision making, for example as in the creation of a useable product. Secondly, develop emotionality, that of being aware of how emotions guide our decision making processes. Such abilities are consistent with Sharp's definition of emotional literacy: "the ability to recognise, understand, handle and appropriately express emotions. Put succinctly, it means using your emotions to help yourself and others to succeed" (2001:1).

Interestingly when you consider the top two of McPhails model alongside the top two of Bloom's taxonomy (evaluation and synthesis) you realise why Design and Technology is so tough to deliver effectively as delivered correctly you are making significant cognitive and emotional demands!

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