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Learning and the Senses

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Part 1

Learning and the person
Learning and the senses

Paul Martin and Viv Martin

Introduction

Are you sitting comfortably? No, really, are you sitting comfortably? At this moment are you at all aware of your body and the state of relaxation or tension within its various parts? Are you gripping this book more tightly than is really necessary to hold it up? Is your sitting position such that extra strain is being put on your neck and shoulders in order to hold your head upright? Are you frowning unnecessarily? How do you know any of this?

The information about our bodies and the outside world comes through what we loosely call our senses. It is difficult, however, to separate the working of our senses from our cognitive functioning and interpretations. Early references to the senses appear in the Katha Upanishad, written between 400 and 800 BC. It likens the senses to ‘horses’ that draw the ‘chariot’ of the body, with the mind as ‘reins’ and the ‘charioteer’ as the potentially controlling reason. It describes the purpose of the senses as, ‘this by which we perceive colours and sounds, perfumes and kisses of love; by which alone we attain knowledge; by which verily we can be conscious of anything’ (Mascaro, 1965: 62).

This Upanishad identifies the five senses that Western society sees as the main senses, namely sight, sound, smell, touch and taste. However, these are only the senses of which we are most aware. Barbara Stafford (in Elkins, 2008) sees our consciousness as, ‘borne aloft on an ocean of “automatic life regulators”’, which are estimated to be approximately 90% of our bodies’ sensory systems including balance, temperature regulation, heart rate, breathing, gland secretions, pain, kinaesthetic sense and many others. As well as the core physical senses, there are other senses such as telepathy and extra sensory perception that Sheldrake (2003) calls aspects of ‘the extended mind’, which appear in human experience but which, as yet, have little scientific evidence to support their existence. He has also proposed a hypothesis of ‘Morphic Resonance’ (Sheldrake, 2009), where past forms and behaviours of organisms can affect organisms in the present across time and space.

The senses

Of the five main senses, Laird (1985) quotes research that found that 75% of adult learning was through sight, followed by 13% for hearing and with touch, smell and taste accounting for the remaining 12%. Humans arguably developed acuity in their senses related to their particular environment, whether it is being ‘street
wise’ in a city or understanding the very different signs in the African bush. Although the following section deals with the qualities of the individual senses, it should be noted that the senses seldom work in isolation, but mostly interact to create a holistic sense picture for the brain. For example, in eating, the senses of vision, smell, taste, touch and hearing all contribute to our experience.

Smell

Although, today, the sense of smell is less valued in Western culture than sight, Goleman (1996) says that it is ‘the most ancient root of our emotional life’ and that it was, ‘from the olfactory lobe [in the primitive brain] the ancient centres for emotion began to evolve, eventually growing large enough to encircle the top of the brainstem’ (Goleman, 1996: 10). As the brain structure grew, the limbic system developed learning and memory, giving mammals greater chances of choice and survival. Finally, humans developed a large neocortex which is the ‘seat of thought’ and which, ‘ … contains the centres that put together and comprehend what the senses perceive’ (Goleman, 1996: 11). He observes that, as the emotions were the root from which the brain grew, it is not surprising that emotions have such sway over thought processes.

Like all the senses, the sense of smell was developed as a way of gathering information about the environment surrounding the living organism. Although humans do not have a particularly well-developed sense of smell compared with many animals, it does have many practical uses. These include: the safety of potential food; the detection of particular trees or plants nearby; the detection of prey, or types of animals in the vicinity; and the detection of potential dangers from lions or other species or from fire. It also plays a large role in the sense of taste and the appreciation of food. Smells can trigger strong memories from the past or create desires (as do the smells of coffee or bread, which are used in many supermarkets to encourage their purchase).

Sight

In Western culture, sight is considered to be the most important of the senses, and the word ‘seeing’ not only implies ocular vision but has also come to represent a deeper sense of understanding. People with reasonable sight, in most cultures of the world, gain the majority of their knowledge of the external world by gathering visual information. With binocular vision, humans have a three-dimensional view of the world that helps them to judge distance, speed, relative speeds and sizes, which in turn helps us navigate past other pedestrians on pavements, across roads and drive safely, as well as hunt wild animals or play football. Although seeing, as Berger observes, ‘establishes our place in the surrounding world’, he notes that we use words to explain our visual understanding, yet that ‘explanation never quite fits the sight’ (Berger, 1972: 7) and is consequently inadequate.

Sight plays a central role in communication through the use of signs and written language which open up access to a vast wealth of information and knowledge via written and diagrammatic languages stored in visual form. It also adds an important dimension to interpersonal communications through the ability to observe body language, which can often show what a person is feeling and be contrary to their spoken words. Cultures across the world and throughout human history have also developed visual languages in a variety of art forms and for a variety of reasons, ranging from prehistoric cave painting, through Renaissance art, to modern conceptual art. For visual artists and their audiences sight also allows dialogue with the visual world to explore and make shared meanings.

As people grow and develop as individuals within a multilayered culture, much of the information they receive about their environment or world stage comes to them from a discipline, cultural group, family, peer group or organisation, all of which have their own constructs, values and philosophical base. This process of socialisation which helps to transmit social norms and which as members of a culture/
community we all undergo, helps to structure our thought systems, informs our value systems and predisposes us towards certain ways of seeing, thinking, behaving and understanding.

With the sense of sight, the data-collection and sorting processes of the human brain relating to visual stimuli rely heavily on patterning and pattern recognition, relating new information to existing constructs/patterns or concept maps and evaluating the data against them. Though formed through actual physical experience, visual understanding is also heavily affected by an individual’s existing knowledge, values, beliefs and their societal norms and constructs. These pattern-forming processes of the brain are at a practical level of human activity very beneficial, especially for survival. Our visual perception of the world that we inhabit and through which we move is, over time, codified into a series of constructs or symbols that aid our recognition and help us to live more effectively and safely in it. Moving through a daily landscape, it is useful to recognise objects such as doors, chairs, tables, etc. so that, from a multitude of design possibilities, we have little difficulty and waste little time in their recognition. We become adept at judging the type, speed, direction and distance of cars, a skill upon which our continued survival depends.

The negative side of this pattern/mapping process arises from the way in which the brain filters new information from external sources through its existing visual and mental constructs and accepts or rejects it on the basis of its match with those existing constructs. If the visual construct-forming and -matching process becomes automatic, unconscious and uncritical of itself, it can lead ultimately to the reinforcing of existing beliefs and values and the rejection of anything that does not fit with them visually or otherwise. We may see that an object is a cup, but absorb nothing about its specific nature. Many people think that vision is an unproblematic form of information gathering relating to the external world and have never questioned the extent to which their perceptions of the world have been stereotyped by the brain’s object-identifying process and their inherent socialised beliefs and values.

**Hearing**

We have the ability to hear sound through our ears, but we are also aware of sound through our sense of touch by means of our ability to feel vibrations. We also communicate by making sounds through our voices as words or song, or by playing instruments, from the basic drum and flutes (found in ancient civilisations), to violins, pianos and electronic synthesisers. Hearing is fundamental to communication through our origination of sound and through our ability to hear and interpret sound, though people who lose their hearing often learn to receive communications through their senses of sight or touch. Although, in Westernised cultures, sound is perhaps mostly related to interpersonal communication through spoken language, it is also important in interpreting our environment, from the direction and speed of a car, to the approach of a dangerous animal through the rustling of grass.

Sound in the form of music can also have a powerful influence on human feelings and behaviour. Greenfield notes how ‘collective chanting, singing and moving in synchrony’, can create a ‘blurring of waking/dreaming boundaries and a heightened emotional salience’ (Greenfield, 2008: 239–40). Such states are about the meaning that they embody, which can range from meditation to support for an extreme religious or political belief. She also cites research that indicates that music can ‘improve attention and aid memory’ and that ‘listening to music can cause neural activation in regions of the brain strongly related to emotional processing’ (Greenfield, 2008: 243).

**Taste**

Interestingly, the sense of taste is fairly limited and ‘only four kinds of taste can be distinguished, namely sweet, sour, salt and bitter’ with other ‘flavours detected by the olfactory mucous membrane’ (Glenister and Ross, 1974: 297). The sense of taste is mostly related to the identification of types of food and its safety, in
tandem with sense of smell. However, it is also involved in sensual enjoyment. The word ‘taste’ is also used to mean quality of choice from the refinement of palate, to art, clothes or interior decor.

**Touch**

From a simple viewpoint, the sense of touch is how we learn about the nature of objects through interaction with their surfaces and feeling their textures, hardness, softness, etc. Yet the sense of touch is extremely complex, as it is linked through the nervous system to other sensory systems that can detect temperature or react to pain. Touch is also linked to the emotions – disgust at slimy or viscous surfaces, delight at feeling soft sand with your toes, shock at feeling hot or cold sensations.

The development of complex co-ordination skills needed for walking involves sight, balance, muscle control, sense of weight distribution via touch, but also a sense of the surface being traversed. Allied with this is a more internal awareness of breathing, physical states of tension or pain. These functions are normally accepted as part of our day-to-day experience, but processes such as yoga or meditation can heighten awareness of the autonomic nervous system to the conscious state. Many skilled activities, such as carving wood or drawing, need good hand-eye co-ordination and acute sensory motor skills, using a range of senses including sight, touch and balance to control tools and to receive constant feedback from their contact with the material in order to take both reflective and non-reflective action.

‘Are you sitting comfortably?’ is no idle question. Many people lose touch with a sense of how their body feels unless they stub their toes on a stone. Having taught yoga students how to stretch, we find it interesting how many, at first, have little concept or inner feel for the difference between stretching and relaxation of any part of the body. Few, at first, can focus on their right foot whilst being aware of the rest of their body’s position and state. Natural ways of being in our bodies as children are often lost in adulthood, especially in Westernised cultures which increasingly split body and mind.

**Experiential learning**

Learning from our embodied experience is a fundamental human (and animal) process. In experiential learning our senses collect much of the data from which we interpret and learn about our surroundings. The pedigree of this approach can be found in the ancient Greek philosophers, where Aristotle, the teacher of Alexander the Great, believed that ‘human curiosity was infinite’ and, contrary to other philosophers such as Plato and Socrates, he ‘placed less reliance on discussion … than on research and inductive logic. In Aristotle’s approach, each inquiry began with the exhaustive compilation of existing evidence, both physical … and written’ (McLeish, 1998: 5). Aristotle founded a Lyceum in Athens in 335 BC based on his methodology – which lasted 860 years, demonstrating that experiential learning was consistently valued. Socrates, like Aristotle, inhabited ‘a world of uncertainty about the truth’ but, instead of being based on physical research, it was one of ‘continual argument’. ‘His method of teaching was one of questioning, of attempting to formulate a definition of something and then trying to test its accuracy by a careful analysis of its meaning’ (Brownhill in Jarvis, 2002: 70). Both these approaches were based around a process of critical thinking that challenged existing knowledge and cultural beliefs and concepts, but in many ways the word-based Socratic form of establishing knowledge has become more valued than the use of the senses and experience.

Much of our initial learning as small children is informed by our senses. Although the impact of an impaired sense may limit some forms of information, other senses may be heightened to compensate. The developmental psychologist Jean Piaget (1962) observed that, by 6 months of age, most people have developed a simple set of what he called ‘action schemes’. These actions, such as rolling a ball and watching it move, are basically cause and effect observations and experiences which are practised and gradually joined together to create more complex actions.
Dewey commented on the importance of environment in learning, saying that people live ‘in the concrete, that they live in a series of situations’, in which, inevitably, ‘interaction is going on between an individual and objects and other persons’ (Dewey, 1997: 43). He defines an ‘experience’ as a ‘transaction’ that takes place between an individual and their environment and sees that environment as, ‘… whatever conditions interact with personal needs, desires, purposes, and capacities to create the experience which is had’ (Dewey, 1997: 44).

Our awareness of something new in our environment may involve several stages. In Ehrenzweig’s (1984) model he suggests three stages. In his first state, of ‘fragmentation’, the person must put themselves in a state of ‘de-differentiation’ by overriding their existing models of understanding and tolerating opposing possibilities and potentials and the anxieties that this may cause. In the second state, the person must initiate unconscious scanning, allowing new possibilities to emerge and gradually integrating new structures through countless cross-ties and connections. Finally in the third state, of ‘re-introjection’, or re-differentiation takes place, in which conscious awareness of the new whole emerges as a new entity.

However, seeing anew or understanding things differently can be difficult to achieve. Our backgrounds and experience as children and adults have a profound effect on how we interpret the evidence collected by our senses. As Eisner observes:

The impact of different frames of reference upon the ‘same’ phenomenon is well illustrated by the comments made by a minister, real estate broker, and a cowboy, each of whom stood on a cliff overlooking the Grand Canyon. After several moments of gazing, the minister pondered, ‘What a great gift of God’, the real estate broker mused, ‘What a fantastic place to build motels’, the cowboy exclaimed ‘What a hell of a place to lose a cow!’

(Eisner, 1972: 69)

Kolb’s four-stage ‘experiential learning cycle’ (Kolb and Fry, 1975), although rather simple in comparison with the complexity of the actual learning experience, is, however, a useful way of considering the various elements of experiential learning and the extent to which the senses contribute to experiential learning.

Concrete experience and awareness

The first stage of Kolb’s experiential cycle, concrete experience, is usually described as being aware of an incident, a phenomenon or something unusual that stimulates an interest in further investigation. In this first stage there may be data collection, an awareness of links and emerging relationships and the identification of questions, all of which involve more than just sensory input. Gaining information about this initial experience may involve all the main senses, including seeing, hearing, touching, smelling and tasting, but also aspects such as pain, balance and temperature. Real awareness of this information and its range requires a conscious effort of the brain if the default response settings are not to preclude the potential of a new experience.

This is reminiscent of our original question – are you sitting comfortably? How do you know the answer to this question? And even if we consciously engage the relevant senses, how do we know that we can trust the brain’s conclusions? If the brain is, as Stafford suggests, ‘… a set of self-sustaining and self-reflexive functions [that] performs largely unconsciously and autonomously, even when it adapts to changing surroundings’, (Stafford in Elkins, 2008: 32), then what does that mean for learning, given the 10 per cent for which we can be conscious? How can we actually be open to an experience and not engage the constraints of existing filters with pre-knowledge and beliefs?
Observations and reflections

In this second stage, the learner reflects on their concrete experience, focusing on the event, mapping relationships and formulating questions, a process of exploration and development of ideas. The new experience is compared with the learner’s existing knowledge, values and beliefs. Much of this activity takes place in the brain without the use of the senses. The learner may decide to collect additional information, in which case any or all of the senses may be employed. Structuring an investigation, however, requires input from the brain if the data collection is to be anything other than random.

Formulation of abstract concepts

In this third stage of the experiential learning cycle, the learner begins forming new or revised ideas and generalisations from their reflections and interpretations. Tentative answers may emerge, which may be checked out with a community in context. Mental maps may be redrawn and new plans created to test out the new hypotheses. The senses may be involved in some of these activities, but analysis and interpretation requires more, specifically the critical capacities of the reasoning brain.

Testing implications and concepts

In this final stage the learner takes action to test out their new ideas by applying them in practice. Testing may require the use of all or many of the senses in question formation, but will also include structuring of the investigation process, analysis and interpretation. It will also include the forming of conclusions or possible answers, identification of additional questions and consideration (awareness) of the relationship of this new learning to the context. This may lead to a further cycle.

Learning is not necessarily cyclical and linear in nature. It may not be recognisable as clear episodes, but is often perceived in retrospect as having emerged from a series of incidents that may only be related by having occurred at a similar time, suggesting broken circles or spirals, with the four stages happening in any combination or order. As can be seen from this brief review of the use of senses in the Kolb cycle, they play a key role in all the stages, but are only effective when fully engaged with a critical reasoning capacity.

The senses in formal education

Traditional ideas of the primacy of visual and auditory senses in receiving text and speech (Classen, 1997) and manifesting in what McWilliam (2007) calls the ‘sage on the stage’, have, almost unquestioningly, been the backbone of education delivery in Western culture. In spite of the prevalence of a knowledge transmission model of teaching and learning, Barr and Tagg (1995) recognise a shift from an ‘instructional’ to a ‘learning’ paradigm that is changing the role of higher education from a ‘place of instruction’ to a place to ‘produce learning’, favouring a more experiential approach.

Academic disciplines in formal education use the senses in learning in different ways. The use of senses is often associated with the teaching of practical and applied subjects. Some examples include:

- In art and design, the development of hand–eye co-ordination in drawing links sight with touch, balance and muscle control of the hand and arm, in a continuous feedback process.
- Singing involves correct posture (whole body) as a foundation for the awareness and control of breathing, which is the basis for voice production.
- An orchestral musician has to listen to the sound their instrument is making whilst being aware of how their sounds fit into the overall body of sound and must do this whilst physically playing the instrument, which itself requires great bodily co-ordination.
In pharmacy, interpersonal skills and empathy are taught through role play. Students have to learn to interpret and respond to customer needs by dealing with the whole person through voice (hearing) and body language (sight).

Like an artist, a surgeon has to develop good hand–eye co-ordination and physical sensitivity and dexterity and may also use the senses of sound and smell.

Dance involves total bodily co-ordination in movement, control of breathing and balance, sight and hearing to relate to space, other dancers and any music being played.

The experience of the University of Brighton Creativity Centre, part of ‘InQbate’, the Centre for Excellence in Teaching and Learning in Creativity, supports a broader and more conscious use of the senses in learning and teaching. The Centre, a flexible, technology-enhanced space, has seven ceiling-mounted projectors, a 5-metre, curved, back projection screen, a sound system, coloured lighting, temperature controls, moveable ‘write-onable’ walls and bean bags, and can even pump scents into the space. Research on the Centre (Martin, 2010) found that, although its different elements were to varying degrees useful, those that were the most successful in enhancing learning were the moveable ‘write-onable’ walls, which allowed learners to make their ideas visually manifest to others and thus share their ideas.

A significant barrier to learning for mature students is the extent to which established perceptions, values and beliefs can filter and block their ability to transform their understanding of the world in which they live. This is particularly true when learning to be a fine artist. If transformative learning is seen as the process of continually transforming perceptions through reflection, then challenging existing frameworks, or at least suspending them, becomes a necessary part of the learning process if new meaning is to be made. Therefore, it is necessary to unlearn in order to learn, that is, unlearning in the sense that you have to critically examine your constructs and be prepared to set them aside and look at things afresh (Martin, 2002). The philosopher Krishnamurti said that if he was a teacher he would be, ‘greatly concerned how to bring about this unconditioning in myself and in the student’ (Krishnamurti, 1978: 196).

**Embodied learning**

An education system that separates theoretical thinking from an awareness of learning from experience raises a number of concerns. Burwood observes that we like to think about education as being mostly about the life of the mind, but that this has little meaning in reality outside the ‘life of the body’. He points out that ‘our bodies themselves are active participants in all our knowing’ (Burwood, 2006: 130) and that embodied engagement in learning is essential if we are to be changed, transformed, by that learning:

An education by precept, with its focus on the attempted codification of core elements of disciplinary culture and the externalization of knowledge, appears to assume that it is the mind that learns and that this is a disembodied, detached mind. A phenomenology of education suggests otherwise. Meaning is not something given in codified maxims but something achieved by immersion in a practice and one’s active participation as an embodied agent in a process of self-transformation.

(Burwood, 2006: 132)

O’Loughlin expands on the observation that we inhabit the world as ‘sentient perceptual bodies’ (O’Loughlin, 2006: 76). She describes the creatural dimensions of human beings as, ‘a set of multisensorial powers knowing a world which, while it limits and sometimes firmly resists, is nevertheless shaped and altered in the service of human ends. Embodied human experience thus consists of the interaction with its environment’ (O’Loughlin, 2006: 82). She sees two crucial features of the creatural. The first, that ‘a human being is its senses’. ‘This is the source of our multisensoriality, each embodied individual being is a set of sensory powers, knowing the world of which it is indisputably a part and yet which, through its
collective practices, it continually creates’ (O’Loughlin, 2006: 58). The second, arising from the first, relates to the manner in which humans are located within the environment and their relationships to other humans, species and objects. She suggests that this is best described by an ‘ecological model of subjectivity which relies particularly on the phenomenological sense of place, the notion of bodily intentionality and the relationships between and among all kinds of bodies which constitute specific sites for action’ (O’Loughlin, 2006: 59). This is the antithesis of the mind/body dualism endemic in the education system, and she acknowledges that this idea of the ‘ecological embodied self’ is derived from Merlot-Ponty’s (1968) work on the theory of perception and idea of ‘the flesh of the world’.

The five senses are often commonly aligned to a simplistic Newtonian view of the world of cause and effect, where the person seeing or otherwise sensing their external environment thinks that they are receiving direct and unbiased information. However, as Stafford states:

> We now know that it is totally erroneous to believe that an image of the world is passively 'impressed' on the retina and transferred to be 'received' by a 'seeing' cortex, there to be decoded and analyzed. Vision, as many artists past and present have intuited and shown in their works, is a dynamic process in which the brain, largely automatically, filters, discards, and selects information, and compares it to an individual’s stored record. (Stafford in Elkins, 2008: 32)

Our interaction with the external world is not Cartesian, but more like the quantum realm of physics where, as demonstrated by the wave/particle duality, how you look determines what you find. Thus, our research through our senses is a holistic and phenomenological process. Quantum physics differs radically from Newtonian physics in accepting a universe of multiple realities and possibilities and acknowledging that the enquirer and the method of enquiry are part of that which is enquired into, and both directly affect the outcome of any research. Reality is not fixed, to be discovered, but is instead an infinite array of ‘patterns of shifting, responsive potential’ (Zohar and Marshall, 1993: 24). As Berger observes, ‘The relationship between what we see and what we know is never settled’ (Berger, 1972: 7). Zohar and Marshall (2000) even propose that human consciousness may be created as a quantum structure within the brain.

Gregory suggests that:

> The seeing of objects involves many sources of information beyond those meeting the eye when we look at an object. It generally involves knowledge of the object derived from previous experience, and this experience is not limited to vision but may include other senses: touch, taste, smell, hearing and perhaps also temperature or pain. (Gregory, 1966 (1972 edn): 8)

Like Gregory, the artist and educationalist Eisner (1991) refers to the dangers of ‘antecedent knowledge’ in training the eye to see, and both the physicist Bohm (1994) and the philosopher Krishnamurti (1991) see the process of thought based on existing constructs as fundamentally problematic to the perception of reality, whether visual or otherwise.

**Senses and learning in a social context**

Heron acknowledges that a learner brings their whole person to the learning situation and that, for experiential learning to take place, it does so, ‘… through an active and aware involvement of the whole person – as a spiritual, thinking, feeling, choosing, energetically and physically embodied being’ (Heron, 1989: 11). This person, however, also exists as part of a society with its communal norms and values.
Mezirow observed, ‘... approved ways of seeing and understanding, shaped by our language, culture, and personal experience, collaborate to set limits to our future learning’ (Mezirow, 1991: 1).

An anthropology of the senses emerged as a focus for cultural studies in the early 1990s and there arose a realisation that Western culture had developed a primacy of the visual and auditory senses. European philosophers of the seventeenth and eighteenth centuries thought of sight (and hearing) as the ‘higher’ senses (associated with study of texts and collections of objects) and of smell, taste and touch as ‘lower’ senses, associated with primitive societies. Commenting that the senses are constructed and lived differently in different societies, Classen argued that:

When we examine the meanings associated with various sensory faculties and sensations in different cultures we find a cornucopia of potent sensory symbolism. Sight may be linked to reason or to witchcraft, taste may be used as a metaphor for aesthetic discrimination or for sexual experience, an odour may signify sanctity or sin, political power or social exclusion. Together, these meanings and values form the sensory model espoused by a society, according to which the members of that society ‘make sense’ of the world, or translate sensory perceptions and concepts into a particular ‘worldview’. There will likely be challenges to this model from within the society, persons and groups who differ on certain sensory values, yet this model will provide the basic perceptual paradigm to be followed or resisted.

(Classen, 1997: 402)

As Classen (1997) argues, the senses are not value-free and neither are rationales for learning or the formal systems in which learning takes place. The purpose behind education and learning can therefore be seen to partly determine both how senses are chosen and used and how their information is interpreted. If, as Jarvis states, education is ‘frequently regarded as a humanistic process’, then this is in conflict when ‘... the very nature of society in which education occurs emphasises the “having” mode and expects repetitive action and non-reflective learning so that it can produce people who can rehearse what they have acquired’ (Jarvis, 1992: 153–54).

This view is reflected in Feinberg’s (cited by Carr in Wellington, 1993: 225) two paradigms of the social function of education. In the first, he sees education as mainly economic and vocational and concerned mainly with ‘... the transmission of technically exploitable knowledge’. This relates to modern ideas of ‘knowledge transfer’ and concepts of teaching and learning that revolve around the telling mode in which the passive learner absorbs disembodied information through sight and sound. This is learning in the ‘having’ mode, with the learner/consumer acquiring knowledge as a detached object that reinforces their cultural position, values and beliefs.

In the second model, he sees education as mainly political and cultural and intended to ‘... further social participation ... through the development of interpretive understanding [and that participants are] active partners engaged in a process of self-formation’. This is similar to Freire’s (1972) concept of ‘emancipatory learning’, which Apps calls learning, ‘which frees people from personal, institutional, or environmental forces that prevent them from seeing new directions, from gaining control of their lives, their society and their world’ (Apps cited in Brookfield, 1987: 12). This type of learning, which Seneca, nearly 2,000 years ago, said is one in which a person is free because ‘they can call their minds their own’ (cited by Nussbaum, 1997), requires the learner to engage critically with the learning process and question their experiences and sensory input, whatever its source.

Making new meaning

The physicist David Bohm says, ‘... the being of ourselves is meaning; the being of society is meaning ... [therefore] a change of meaning is a change of being’ (Bohm in Pylkkänen, 1989: 23). The ability to learn
and to accept that learning leads to change is central to living our lives, it is the natural state of the universe – so why do so many of us find change such a challenge?

Many artists have realised that the nature of external reality can manifest itself in many different visual interpretations and can be ambiguous. They adopt, in effect, different glasses through which to view the world and interpret what they see, whether Impressionist, Fauvist, Cubist or Constructivist. Their visual perception is a conscious and critical process, rather than unconscious and accepting of the known. Art can therefore be seen as a creative or re-creative process which is explorative by nature and is ultimately a meaning-making process. Arnheim (1969) argues that this perception is not a separate function to thought, but that the whole process is one of ‘Visual Thinking’ which is image based, though may relate to intellectually expressible ideas or emotions.

John Briggs and Frank McCluskey observe that artists have ‘grounded themselves in the ambivalence of meanings and have worked to reveal to us the nuances and uncertainties that infiltrate our apparently absolute perceptions and truths about life’. They call this ‘omnivalence’, and define it as, ‘a mental state in which many meanings converge in so many ways that one feels the immensity of meaning without being able to pin down any absolute meaning specifically’ (Briggs and McCluskey in Pylkkanen ed. 1989: 279).

The neuroscientist Susan Greenfield argues that a key trait of the ‘… individual human brain is its dynamism, its ability to respond to individual experiences and in so doing to generate a personalized brain, a mind’ (Greenfield, 2008: 228–29). Yet, this openness to change can mean that one’s identity is ‘quite precarious’, and she sees the adoption of belief systems as a defence against ‘being all things to all people’ and helping us to ‘navigate the world’ without having to resort to ‘reason’ at every turn. She argues that these beliefs, like all human knowledge, are forged through ‘personalized neural connections’ and, just as psychological filters may predetermine perception, so repeated reinforcement of particular thinking patterns can build synapses and reinforce particular neural pathways making certain perceptions physically more likely.

Greenfield identifies three ways of thinking about the mind, the concepts of: ‘someone’, where, at its extreme, there is the cult of the individual but without ultimate fulfilment; ‘anyone’, where there may be fulfilment through abandoning individuality for the security of a group’s beliefs, such as in a religion; and, finally, ‘nobody’, where the individual is at the mercy of sense gratification, rather as the Katha Upanishad describes the charioteer, ‘… whose mind is never steady is not the ruler of his life. Like a bad driver with wild horses [the senses]’ (Mascaro, 1965: 62).

None of these models offers a satisfactory way forward, but Greenfield like Zohar and Marshall (1993) begs the question, how can we balance the self-actualising needs of the self, individual, particle, with those of the community, wider society or wave? This is especially pertinent in such a rapidly changing, technologically imbued environment, impelled by a globalised market economy with consumerism as its driving force, in which our senses are assailed with such a cornucopia of possibilities that it becomes difficult for our charioteer not to drop the reins and let the horses run wild.

References
Learning and the senses


