Bateson's Levels Of Learning: a Framework For Transformative Learning?

Dr Paul Tosey
Centre for Management Learning & Development
School of Management
University of Surrey
Guildford, Surrey GU2 7XH, UK
Tel. +44 1483 689763 e-mail P.Tosey@surrey.ac.uk

Abstract

This paper is principally an appreciation of Gregory Bateson's `levels of learning'; a reconnection with, and latest attempt to fathom, a framework that has influenced my thinking for years. This is also part of an intellectual project to develop a systemic understanding of learning for management development and Higher Education contexts.

The purpose is to explore Bateson's framework as a vehicle for indicating multiple possibilities of learning from experience. Bateson's framework may also synthesise a variety of ideas about `learning to learn', and represent an intersection of disparate literatures of education, management learning, organisational learning, and transformative learning.

Keywords: learning; Bateson; epistemology; transformative; cybernetics; systems.

Gregory Bateson (1904 - 1980), an `eminent biologist and systems theorist'[i], influenced diverse fields including cybernetics, family therapy and communications studies (Hawkins 2004:410). The son of the geneticist William Bateson[ii], he married Margaret Mead, the anthropologist. Bateson also attended Charterhouse School (in the town where I now live[iii]). For reviews of Bateson's life and work see Harries-Jones (1995), Levy and Rappaport (1982), and Lipset (1980) [iv].

Bateson's `Steps to an Ecology of Mind' (1973, 2000) would probably be my desert island book. I first came across it while working on my doctorate, through people who also remain influenced by Bateson (Hawkins 2004; Marshall 2004; Marshall & McLean 1985; Reason 1993).

Bateson was also a formative influence on Neuro-linguistic Programming, one of my main research interests, (see foreword to Bandler and Grinder 1975; Bostic St. Clair & Grinder 2002; Dilts & DeLozier 2000). For me Bateson's work represents an intellectual underpinning for NLP, providing important epistemological and ethical principles. Bateson (1979:242) defines epistemology as:

`A branch of science combined with a branch of philosophy. As science, epistemology is the study of how particular organisms or aggregates of organisms know, think and decide. As philosophy, epistemology is the study of the necessary limits and other characteristics of the processes of knowing, thinking and deciding.'

This paper is both an intellectual challenge and a labour of love. I feel aesthetically and intellectually drawn to Bateson's emphasis on `the pattern that connects'. But I also wonder if I am capable of understanding what he was talking about. Brockman notes:

`Bateson's readers often find it difficult to grasp that his way of thinking is different from theirs… Bateson is not clearly understood because his work is not an explanation, but a commission, As Wittgenstein noted, "a commission tells us what we must do." In Bateson's case, what we must do is reprogram ourselves, train our intelligence and imagination to work according to radical configurations'. [v]

My desire to use Bateson's ideas to illuminate issues of learning feels both risky and adventurous. The paper is therefore an exploratory walk through an appealing but deceptive landscape.

Bateson's Levels of Learning

How does Bateson's work relate to learning? Briefly, learning is a systemic phenomenon (the mind does not reside in the brain); it is inherently relational, emergent and recursive, involving multiple logical levels (Capra 1996; Hawkins 2004). `Basic to this epistemology was the differentiation of logical levels, including the relationship between the knower and the known, ergo a recursive epistemology'[vi].

In 1964 Bateson wrote `The Logical Categories of Learning and Communication' (1973:250–279), which merits a close reading. Bateson describes it as an attempt to illuminate `the barriers of misunderstanding which divide the various species of behavioural scientists… by an application of Russell's Theory of Logical Types to the concept of "learning".' (Bateson 1973:250). According to Flemons (1991:5–6):
.

`Russell's *Theory of Logical Types* distinguishes between levels of abstraction… the notion of logical types is used by Bateson as a way of charting the classification inherent in all perceiving, thinking, learning, and communicating.

A class is a different logical type, a higher level of abstraction, than the members it classifies: The class of "all books" is not itself a book; the name of a thing is itself not a thing, but a classification of it... This hierarchy of types - classes, classes of classes, classes of classes of classes, and so on - provides a convenient bridge to the critical notion of *context* and the interdependence of wholes and parts. The notion of levels makes clear that learning, for example, is a contextual affair; one not only learns, but simultaneously learns how to learn.' Thus:

`Lewis Carroll's Alice asks the White Knight the name of the song he's going to sing for her. He says the name is called "Haddock's Eyes".

Alice thought that to be an odd name for a song and the Knight responded, "No, you don't understand. That's not the name of the song, that's what the name is called".'
(Keeney 1983:34)

According to Bredo (1989:36), Bateson's levels of learning are `properly viewed as a framework and not an elaborated theory'. Bateson posits five levels (L0, LI, LII, LIII and LIV –definitions in table 1), although he said little about LIV. Here I consider mainly LI, LII and LIII.

Learning IV	`…would be *change in Learning III*, but probably does not occur in any adult living organism on this earth.'
Learning III	…is *change in the process of Learning II*, e.g. a corrective change in the system of *sets* of alternatives from which choice is made.
Learning II	…is *change in the process of Learning I*, e.g. a corrective change in the set of alternatives from which choice is made, or it is a change in how the sequence of experience is punctuated.
Learning I	…is *change in specificity of response* by correction of errors of choice within a set of alternatives.
Learning 0	…is characterised by *specificity of response,* which – right or wrong - is not subject to correction.

Table 1: The levels of learning

As an alternative description of these levels, see Bateson's paradigmatic story about a dolphin in training (1979:135–137).

The Levels and Literature

This framework appears in diverse literatures: e.g. Bales (1995), Bartunek and Moch (1994), Bloom (2004), Dilts & Epstein (1995), Keeney (1983), Peterson (1999), and Watzlawick et al (1974). It influenced Argyris and Schön's (1978) `single and double loop learning'.

In Tosey (2005) I used the levels to explore organisational learning, arguing that only a framework such as Bateson's, which differentiates between logical types, enables us to understand organisational learning appropriately as multi-dimensional, paradoxical and aesthetic.

Bateson's framework also appears in educational and management texts, often in relation to `learning to learn' – an imprecise term that does not necessarily denote learning at a higher level. For example, Brockbank and McGill (1998:41) describe the levels but portray LIII (incorrectly, in my view) as a more sophisticated form of reflection.

While there is no direct link with Bateson to my knowledge, Mezirow's (1991) concept of `perspective transformation' (which builds on the work of Habermas) is redolent of Bateson's LII and LIII. Tosey et al's (2005) case study included critique of the conceptualisation to date of transformative learning and advocated Bateson's `levels' as a suitable framework. Finally, the levels seem relevant to recent work on metalearning (Jackson 2004), the notion of `meta' also implying multiple logical levels.

Critique of Bateson appears limited. Appraisals tend either to reject Bateson altogether, or to grapple appreciatively with his ideas, but rarely to critically evaluate his stance (e.g. Midgley 2003).

Recursion

Bateson's levels describe orders of recursion, a hierarchy of logical types not a hierarchy of contents (Keeney 1983; Woodsmall [no date]). As orders of recursion, the levels are like nested loops or Russian dolls.

Indeed Bateson's use of metaphors such as `levels', `higher' (1973:265) and `ladder' (1973:278) appear to emphasise hierarchy more than recursion. I set out in this paper to develop Bateson's ladder into a `climbing frame' illustrating a variety of emphases of LII. This metaphor, although congruent with Bateson's, now seems unhelpful. The issue is important, though, for reasons I address in the final section.
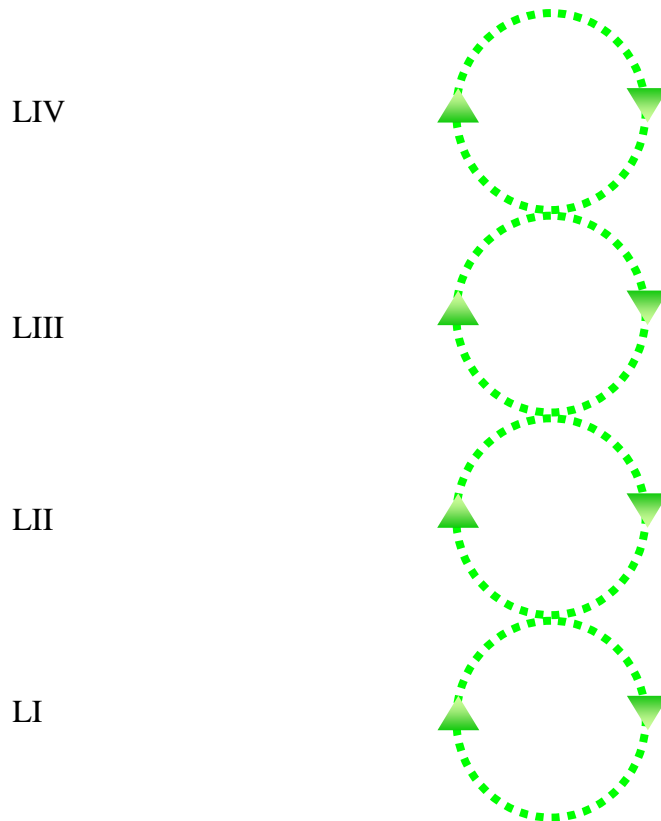
LIV

LIII

LII

LI

Figure 1: Stacked Loops

The levels can be represented in a variety of ways, for example as in table 1. Alternatively, based on Hawkins (1991), they can be `loops' stacked one on top of the other (figure 1). Alternatively figure 2 portrays the recursive characteristic directly. Note that:

- Contrasting with the idea that `learning to learn' is a more sophisticated form of learning (e.g. `Learning to learn... Will help you ultimately with everything you need or want to learn in the future.', Pedler et al 2001:260), *higher orders of recursion are not `superior' to lower orders*. They can be `generative' (Senge 1990:14) in positive and negative respects, both liberating and limiting.
- Loops occur simultaneously, not sequentially: `… this multilevel approach to change is not a stage theory moving sequentially from lower to higher levels of learning. Rather, the different levels of learning go in parallel' (Bredo 1989:32).
- The higher orders of recursion comprise `metacommunication' about the way communication is to be understood. There is reciprocal influence between these levels.
- Mismatches between levels have real communicational and psychological effects. `Where Russell and Whitehead's approach to this problem, in their theory of logical types, was to ban all such sentences by cleanly separating statements at different logical levels, Bateson pointed out that good logic may be bad natural science. Some of the most interesting aspects of communication

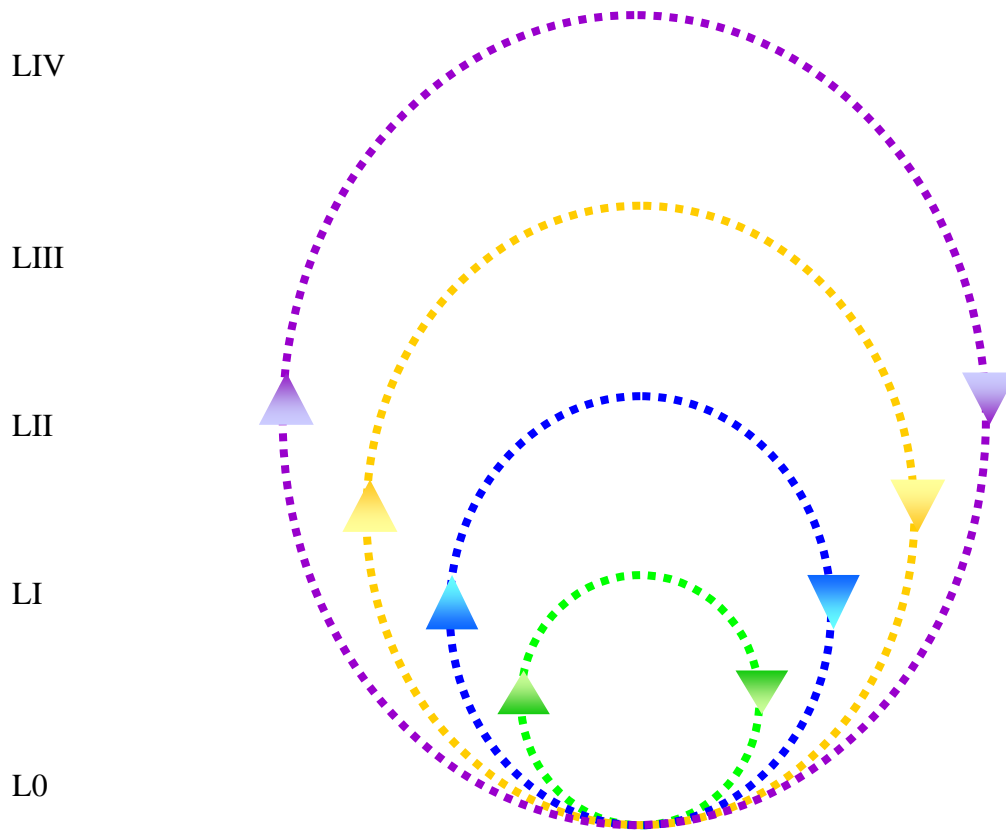may depend upon the use of contradictory messages at different logical levels…' (Bredo 1989:30).

LIV

LIII

LII

LI

L0

Figure 2: Nested loops

The Experience of Learning

I will now walk through Bateson's levels, referring to a recent learning experience of my own, a training course I chose to attend. In my experience, Bateson's framework provides rich and challenging questions; it is neither straightforward to apply, nor does it provide a simple explanation of events.

Learning 0

Learning 0 (zero) entails responding to stimuli but making no changes based on experience or information. L0 is implied by the two mice who continue to look for their cheese in the same place each day, even after it has disappeared, in `Who Moved My Cheese?' (Johnson 1998).

The training participant who seems to learn nothing is probably familiar to all, and typically is framed as a difficulty, though it may not be so for that participant. While I believe I experienced significant learning during my training course, I have

no doubt that I also produced automated response. For example I responded to stimuli such as the trainer's instructions.

Learning I

My course enabled me to learn new skills, for example a model of questioning (Lawley and Tompkins 2000). Attending the course made the difference between knowing the existence of these questions (I came across the book some years ago) and having sufficient understanding to try them out. I then learnt to become more effective through correcting errors in my use of the questions.

LI is the explicit focus of much Higher Education and management learning, involving common notions of `learning' as cognitive, conative and affective - changes in knowledge, skills and attitude. It is also the focus of much learning theory. Behavioural, cognitive and experiential perspectives are much concerned with the acquisition of knowledge and skills. Finally, `learning to learn' often refers to study skills - this is LI in Bateson's framework.

Learning II

At LII the principles of logical typing become more significant. One not only learns but simultaneously learns how to learn. LII (and its relationship with LI) brings a range of concepts about learning into the picture.

LII is essentially about *learning the pattern of the context* in which activity takes place. The context indicates the meaning to be given to behaviour; there is change in *the way events are punctuated*. This also introduces a reflexive aspect to learning; `Instrumental conditioning tasks, for example, teach not only how to discriminate between particular stimuli, but also about instrumentality itself' (Bredo 1989:36).

Bateson usage of `context' (`play', `work', `training', etc.) is perceptual and communicational. Context is influenced socially but also interpreted individually, though there would often be consensus about it. The learnt pattern guides one's action in other, apparently similar contexts. Note also that: `for Bateson a context is the particular whole which a given part helps compose, not something separate from or abstracted from that part' (Bredo 1989:28-29).

I have long thought that Snyder's (1971) notion of the `hidden curriculum' is an example of LII – Bredo (1989:33) apparently agrees. This refers to the tacit expectations and rules for success of formal educational contexts, of which the teachers themselves may be unaware but which they also reinforce. `Savvy' students are quick to discern and orientate to the hidden curriculum.

At the start of my course, I was alert to the norms and expectations of this new setting (e.g. about the level of personal disclosure), and how socialisation was happening in parallel with the overt teaching of content, marking this context as similar to and different from other settings in my experience. I experienced a congruence between the overt, espoused intentions and the `hidden curriculum'. Consider, though, what happens if a trainer explicitly invites feedback, but their

metacommunication discounts its value or uses put-downs. Here the `hidden curriculum' may be interpreted as geared to maintaining power relations between trainer and participants. As another example, one might decide that a team awayday, marked out formally as `play', is more appropriately considered `appraisal', with a `hidden curriculum' of (say) assessment of performance according to the boss' expectations.

This is not to suggest that a rational, logical congruence between levels is the goal. Metacommunication is only partly subject to our conscious influence, is often non-verbal, and is complex because LI and LII are simultaneous and mutually influencing. Nevertheless, people will adapt their behaviour according to such metacommunication. As well as Bateson, Watzlawick et al (1968, 1974), give examples.

LII involves other dynamics too. Bateson himself (1973:220, 271) identifies the phenomenon of transference as LII about the patterning of relationship between (say) a child and a parent. The individual unawarely imports this patterning into other contexts later in life, where its overlay represents L0. A classic example is a relationship with authority figures in the workplace. Thus, `this behaviour is controlled by former Learning II and therefore it will be of such a kind as to mould the total context to fit the expected punctuation… this self-validating characteristic… has the effect that such learning is almost ineradicable' (Bateson 1973:272). `New' LII happens when the individual is enabled through (e.g.) a relationship with a psychotherapist to differentiate between past and present contexts.

Therefore while the potential for LII is constantly present, often we simply reproduce previously learnt patterns (L0). On my course, transference may have influenced the way I related to the trainer; did I re-enact patterns learnt originally in my family? This also illustrates the point that LII is not necessarily superior to or more beneficial than LI. The transferential pattern learnt early in life is likely to be helpful at the time (even essential for survival), but if that pattern persists in other contexts it may become unhelpful.

This view of LII has various implications for management and organisational learning. For example:

1. `Politics' is integral to organisational learning, not, as is sometimes perceived, an impediment to learning (Tosey 2005). `Politics' could be reframed, perhaps, as `teaching and learning about the metarules of context'; `No task instruction can be done in a socially neutral way… It must always… exemplify some form of social relationship…. Bateson's theory helps show how they are different aspects of a common process rather than different things.' (Bredo 1989:37).

2. The nature of (and epistemological framing of) the problem of `transfer of training' is challenged if the content of a learning experience is inseparable from its context. Lave and Wenger's (1991) `situated learning' similarly highlights the significance of context in learning.

3. Across LII there appears to be a varying emphasis on psychological and critical/sociological frames: `Learning theorists tend to focus on individual task learning independent of social context, while socialization theorists focus on the effects of social context independent of the task.' (Bredo 1989:27). Often framed as oppositional, these might both be seen as varieties of LII.

Learning III

What does it mean to say `one not only learns, but simultaneously learns how to learn, *and* simultaneously learns how to learn how to learn'? Bateson added the section on LIII to his essay in 1971, saying that `the concept of "self" will no longer function as a nodal argument in the punctuation of experience' (1973:275); `something of the sort does, from time to time, occur in psychotherapy, religious conversion, and in other sequences in which there is profound reorganization of character' (1973:273). Bartunek & Moch (1994) draw on LIII for their `third order change'. Hawkins (2004:414) says, `For double loop learning to be enabled there is a need for level three or treble loop learning in organizations'.

Bateson (1973:276) refers to being `driven to level III by `contraries' generated at level II'; `The "problem" to which third-order learning is a "solution" consists of systematic contradictions in experience' (Bredo 1989:35). This matches what we have called elsewhere `dilemmas of participation' (Tosey et al 2005).

However, Bateson also emphasised that while double binds can be triggers for LIII, `even the attempt at LIII can be dangerous' (1973:277), leading to psychosis instead of enlightenment It is again the projection of a hierarchical, goal orientated mind-set to see LIII as some kind of `holy grail' of learning; it is not guaranteed to be either benign or transcendent.

Was there an example of LIII in my training course? I would not claim so. However the course's focus on symbolic modes of knowing demonstrated the significance of metaphor at the root of perception, and the profound potential for learning should such metaphors change[vii].

Multiple Modes of Learning?

Having struggled to clarify Bateson's levels for myself (truly a labour of love, with much emphasis on the labour) I arrive at a further question. This recapitulates my initial desire to develop Bateson's ladder into a climbing frame; but I found the ladder flew apart when I tried to include other aspects of learning.

An example concerns processes such as critical reflection (Moon 2005) and double-loop learning (Argyris and Schön 1974). To talk *about* LII necessarily entails discourse of a different logical type; by implication this would represent LIII. Yet: `Learning III is likely to be difficult and rare even in human beings' (Bateson 1973:272). Bateson recognises that writing *about* LII implies a stance `*at the side of my ladder to discuss the structure of the ladder*' (1973:278). So, Bateson allows that one can talk *about* LII without that necessarily constituting LIII. (Logically, this applies equally to the relationship between LI and LII).

Bateson's levels are clearly not about learning as cognitive insight alone. For example:

1. Bateson argued for a `double involvement of primary process and conscious thought… the emotions, those things that we are accustomed to regard as rather amorphous and unintellectual – indeed, as interfering with the effective pursuit of intellect – are the partial perceptions in consciousness of highly precise and patterned forms of computation.' (Brockman 1977:61).

2. At LIII Bateson and Bateson's (1998) conception of the sacred becomes important. They argued that some levels of patterning are so profoundly ecological that they should not be analysed cognitively; to do so would make them vulnerable to conscious thought.

3. The experience of LIII seems highly unlikely to be purely intellectual. Meyer and Land (2005) use `liminality' to describe the process through which students acquire `threshold concepts'. This involves a transition that can be troubling, with change in the learner's identity as well as reconfiguration of their conceptual schema. This links to our work on transformative learning (Tosey et al 2005).

Bateson's levels appear to involve *enacted and embodied change in relation to contexts,* whereas Argyris and Schön emphasise *intentional inquiry into* contexts and their `governing variables', plus *conscious agency* in changing those variables. They differentiate, in fact (1978), between double-loop learning (a process of inquiry) and deutero-learning (synonymous in Bateson's terminology with LII, e.g. Bateson 1979:147).

Indeed I speculate that one can trace a metamorphosis from Bateson's original emphasis via Argyris and Schön to ideas in the literature of learning organisations (e.g. Pedler et al's policy and ideas loops, 1991). This possible metamorphosis (I see some evidence in texts, but this needs further research) is from a notion of embedded, contextual, relational learning into intentional change through inquiry – as a mental, cognitive activity - then later into a de-contextualised notion of managerial skill (e.g. `strategic thinking'), where LIII even becomes identified with a level of managerial hierarchy (e.g. Garratt 1987).

This metamorphosis:

- Recreates the error of identifying the mind with the brain (now, though, the `organisational brain').
- Ignores the dangers of (say) LIII, because higher levels are seen as more desirable than, or superior to, lower.
- Separates knower from known; conscious thought from affect; and reflection from action (i.e. a separation in time).

This seems far removed and epistemologically distinct from Bateson. By contrast, figures such as Torbert (e.g. Fisher et al 2001) and Senge et al (2005) appear to turn back and emphasise, for example, that thinking needs to become more holistic

and paradoxical, mirroring Bateson's insistence (1973:265). that `…no amount of rigorous discourse of a given logical type can `"explain" phenomena of a higher type'.

We may also reach the limits of an analytic mode through recognising the fundamentally metaphorical, embodied nature of mind (e.g. Johnson 1987), echoing the notion that `we are our own metaphor' (Bateson, M. C. 1972). Bateson emphasised the significance of *the aesthetic* in apprehending the patterning between levels; `I have suggested elsewhere… that art is commonly concerned with... bridging the gap between the more or less unconscious premises acquired by Learning II and the more episodic content of consciousness and immediate action' (1973:279).

Thus (Bateson and Bateson 1988:163); `…what is true of tales and words between persons is also true of the internal organization of living things'. Consider the nuances of `learning' in the Sufi teaching stories of the Mullah Nasrudin, an archetypal `wise fool' (e.g. Shah 1973):

`Nasrudin was eating a poor man's diet of chickpeas and bread. His neighbour, who also claimed to be a wise man, was living in a grand house and dining on sumptuous meals provided by the emperor himself.

His neighbour told Nasrudin, "if only you would learn to flatter the emperor and be subservient like I do, you would not have to live on chickpeas and bread".

Nasrudin replied, "and if only you would learn to live on chickpeas and bread, like I do, you would not have to flatter and live subservient to the emperor".'

Is there a pattern that acknowledges both the value and the location (relative to the ladder) of double-loop learning, critical reflection and so on (significant in both management learning and Higher Education), and also acknowledges the aesthetic? My best attempt to reconcile these at the moment is to posit three interrelated `modes' of learning (figure 3, which shows LI, LII and LII only for the sake of simplicity). In this

- The `analytic' mode, intentional inquiry, can lead to changes on the ladder but does not necessarily. Analysis of changes on the ladder may be attempted through such inquiry.
- The `embodied' mode is Bateson's ladder. Changes here may remain unconscious.
- The `aesthetic' mode synthesises and bridges `the gap between' levels. Again, `learning' here may or may not lead to changes in other modes.
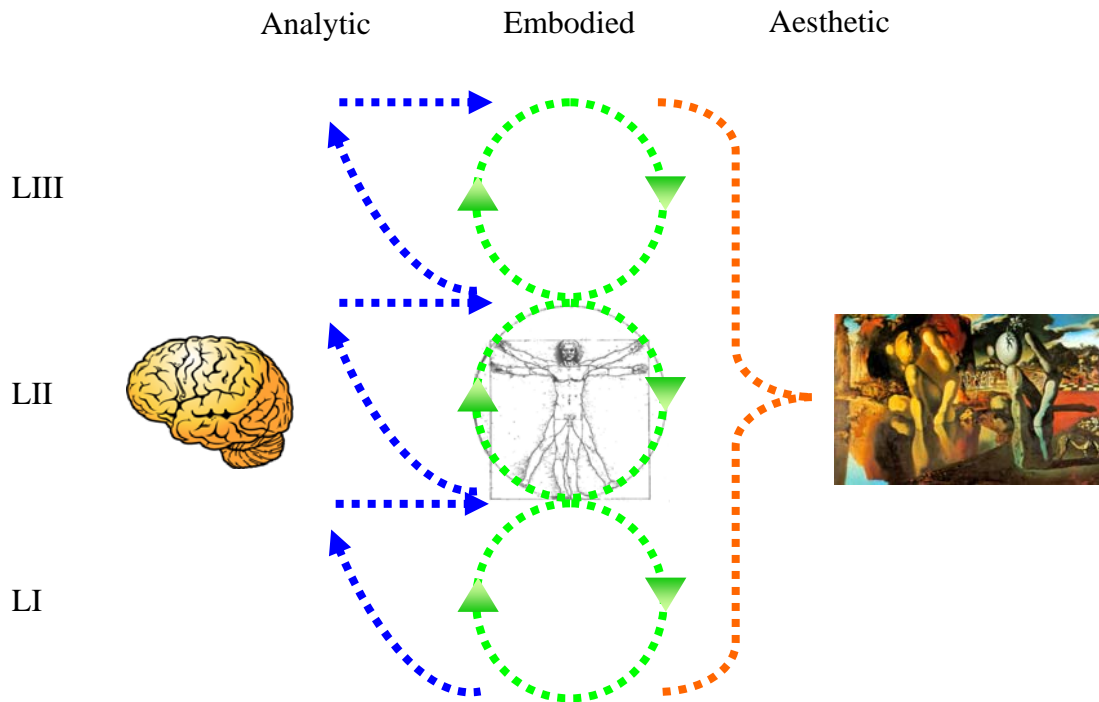
Figure 3: Three modes of learning?

I confess I am not sure whether this synthesis is helpful or simply a way to park the issues. There is much to explore both theoretically and regarding implications for management and Higher Education contexts. Nevertheless, temporarily at least, here is a possible `pattern that connects'.

References

Argyris, C. and Schön, D. (1974) *Theory in practice: Increasing professional effectiveness,* San Francisco: Jossey-Bass.

Argyris, C. and Schön, D. (1978) *Organizational Learning,* Reading, Mass.: Addison-Wesley

Bales, L. S. (1995) `Gregory Bateson, Cybernetics, and the Social/Behavioral Sciences', *Cybernetics and Human Knowing, A Journal of Second Order Cybernetics, Autopoiesis & Cyber-Semiotics,* 3:1 (listed at http://www.imprint.co.uk/C&HK/vol3/v3-1ind.htm, accessed 2.4.2006, page numbers not cited; article available at
http://www.narberthpa.com/Bale/lsbale_dop/cybernet.htm, accessed 2.4.2006)

Bandler, R. and Grinder, J. (1975) *The Structure of Magic I: A Book about Language and Therapy*, Palo Alto, California: Science and Behaviour Books

Bartunek, J.M. and Moch, M.K. (1994) `Third Order Organizational Change and the Western Mystical Tradition', *Journal of Organisational Change Management,* 7:1 24-41

Bateson, G. (1973) *Steps to an Ecology of Mind: Collected Essays in Anthropology, Psychiatry, Evolution and Epistemology,* London: Paladin, Granada

Bateson, G. (1979) *Mind and Nature,* Glasgow: Fontana/Collins

Bateson, G. (1991) *A Sacred Unity: Further Steps to an Ecology of Mind*, ed. R. E. Donaldson, New York: Cornelia and Michael Bessie/Harper Collins

Bateson, G. (2000) *Steps to an Ecology of Mind: Collected Essays in Anthropology, Psychiatry, Evolution and Epistemology,* (revised edition) Chicago: University of Chicago Press

Bateson, G. & Bateson, M. C. (1988) *Angels Fear*, London: Rider Books

Bateson, M.C. (ed) (1972) *Our Own Metaphor,* New York: Knopf

Bloom, J. W. (2004), `Patterns That Connect: rethinking our approach to learning, teaching and curriculum', *Curriculum and Teaching*, 19:1 5 – 26

Bostic St. Clair, C. and Grinder, J. (2002) *Whispering in the Wind,* Scotts Valley, CA: J & C Enterprises

Bredo, E. (1989), `Bateson's Hierarchical Theory of Learning and Communication', *Educational Theory*, 39:1 27 -38

Brockbank, A. and McGill, I. (1998) *Facilitating Reflective Learning in Higher Education*, Buckingham: Open University Press

Brockman, J. (ed) (1977) *About Bateson,* New York: G.P.Dutton

Capra, F. (1996) *The Web of Life: a new synthesis of mind and matter*, London: Harper Collins

Dilts, R. and DeLozier, J. (2000) *Encyclopedia of Systemic NLP and NLP New Coding*, Capitola, California: Meta Publications (available online with limited access at http://nlpuniversitypress.com/, accessed 8.4.2006)

Dilts, R.B. & Epstein, T.A. (1995) *Dynamic Learning,* California: Meta Publications

Fisher, D., Rooke, D. and Torbert, W. (2001) *Personal and Organizational Transformations Through Action Inquiry*. Boston, MA: Edge/Work Press.

Flemons, D. (1991) *Completing Distinctions* Boston: Shambhala

Garratt, R. (1987) *The Learning Organization,* London: Fontana/Collins

Harries-Jones, P. (1995), *A Recursive Vision: Ecological Understanding and Gregory Bateson,* Toronto: University of Toronto Press

Hawkins, P. (1991) `The Spiritual Dimension of the Learning Organisation', *Management Education and Development*, 22:3 166 – 181

Hawkins, P. (2004) `A centennial tribute to Gregory Bateson 1904-1980 and his influence on the fields of organizational development and action research', *Action Research,* 2:4 409 - 423

Jackson, N. (2004), `Developing the Concept of Metalearning', *Innovations in Education and Teaching International*, 41:4 391 – 403

Johnson, M. (1987) *The Body in the Mind: The bodily basis of meaning, imagination and reason*, Chicago: University of Chicago Press

Johnson, S. (1998) `Who Moved My Cheese?', London: Vermilion, Random House

Keeney, B. (1983) *Aesthetics of Change* New York: Guilford Press

Lave, J. and Wenger, E. (1991) *Situated Learning*. Cambridge: Cambridge University Press.

Lawley, J. and Tompkins, P. (2000) *Metaphors in Mind*, London: The Developing Company Press

Levy, R. and Rappaport, R. (1982) `Gregory Bateson (1904 – 1980): Obituary', *The American Anthropologist,* 84:2 (at: http://www.interculturalstudies.org/Bateson/biography.html, accessed 2.4.2006)

Lipset, D. (1980) *Gregory Bateson, The Legacy of a Scientist,* London: Prentice-Hall

Marshall, J. (2004) `Living Systemic Thinking: exploring quality in first person research', *Action Research*, 2:3 309 - 329

Marshall, J. & Mclean, A. (1985) `Exploring Organisation Culture as a Route to Organisational Change', in Hammond, V. (ed) *Current Research in Management* London: Frances Pinter

Mezirow, J. (1991) *Transformative Dimensions of Adult Learning,* San Francisco: Jossey-Bass

Meyer, J. H. F. & Land, R. (2005) `Threshold concepts and troublesome knowledge(2): epistemological considerations and a conceptual framework for teaching and learning', *Higher Education*, 49:3 373-388

Midgley, G. (editor) (2003) *Systems Thinking*, London: Sage

Moon, J. (2005) `We seek it here...a new perspective on the elusive activity of critical thinking: a theoretical and practical approach', ESCalate Discussion Series, http://escalate.ac.uk/2041, accessed 3.4.2006

Pedler, M., Boydell, T. and Burgoyne, J. (1991) *The Learning Company: a strategy*

for sustainable development, London: McGraw-Hill

Pedler, M. Burgoyne, J. and Boydell, T. (2001) *A Manager's Guide to Self-Development*, London: McGraw-Hill

Peterson, T. E. (1999) `Whitehead, Bateson and Readings and the Predicates of Education', *Educational Philosophy and Theory*, 31:1 27 – 41

Reason, P. (1993) `Reflections on Sacred Science and Sacred Science', *Journal of Management Inquiry*, 2:3 273 – 283

Russell, B. (1921) *Introduction to Mathematical Philosophy*, 2nd edn. London: George Allen and Unwin

Senge, P. (1990) *The Fifth Discipline: the art and practice of the learning organization,* London: Century Business, Random

Senge, P., Jaworski , J., Scharmner, C.O., and Flowers, B.S. (2005) *Presence: Exploring Profound Change in People, Organizations and Society*, London: Nicholas Brealey

Shah, I. (1973) *The Exploits of the Incredible Mulla Nasrudin,* London: Picador

Snyder, Benson R. (1971) *The Hidden Curriculum* Knopf: New York

Tosey, P. (2005) `The Hunting of the Learning Organization: a paradoxical journey', *Management Learning* 36:3 335 – 352

Tosey, P., Mathison, J., & Michelli, D. (2005) `Mapping Transformative Learning: the potential of neuro-linguistic programming', *Journal of Transformative Education,* 3:2 140 - 167

Watzlawick, P., Beavin, J.H. & Jackson, D.D. (1968) *Pragmatics of Human Communication* New York: W.W. Norton and Co.

Watzlawick, P., Weakland, J. & Fisch, R. (1974) *Change - Principles of Problem Formation and Problem Resolution* New York: W.W. Norton and Co.

Woodsmall, W. (undated) `So Called Logical Levels and Systemic NLP', at http://www.cnlpa.de/presse/loglev.html, accessed 2.4.2006

[i] http://www.interculturalstudies.org/Bateson/index.html 3.4.2006
[ii] http://www.amphilsoc.org/library/mole/b/batesonfam.htm; 2.4.2006
[iii] http://www.nndb.com/edu/320/000110987/; 2.4.2006
[iv] See Bateson's CV at http://www.edge.org/3rd_culture/bateson04/bateson04_index.html, 2.4.2006
[v] `Gregory Bateson: The Centennial 1904 – 2004', http://www.edge.org/3rd_culture/bateson04/bateson04_index.html 2.4.2006
[vi] http://www.oikos.org/stepsintro.htm 3.4.2006

[vii] http://www.cleanlanguage.co.uk/ 3.4.2006