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A Conversational Framework for Self-Organised Learning:

Modelling Personal Meaning for Effective Action in the World

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Sheila Harri-Augstein
and Laurie F. Thomas.

Centre for the Study of Human Learning (C.S.H.L) 2008

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Sheila Harri-Augstein
and
Laurie Thomas
Centre for the Study of Human Learning

Introduction

People learn by making sense of the world for themselves, thereby constructing personal meaning. Effective learners are aware of how they do this and can actively organize this process for themselves. They engage in a reflective conversational process called self-organised-learning (SOL). In western cultures the education system inhibits SOL because it is founded on the outmoded belief that all knowledge is objective and that learners are expected to absorb what is given. Teachers and trainers are expected to treat learners as 'objects' to be manipulated and they are prevented from developing their capacity to learn. They become 'other-organised-learners' and often suffer from life-long learning pathologies, which constrain their growth. This chapter describes conversational techniques for supporting SOL, plus the science and philosophy behind them. The techniques are practiced within a Learning Conversation methodology designed to empower individual, team, and organizational growth, and have been proven effective in many educational and commercial situations. Fundamental changes and a paradigm shift are essential in education policy to enable many more to become life-long self-organised-learners and through their effective activities, transform our cultures. SOL empowers personal skill, competence and creativity and is of value in tutoring, coaching, team learning, e-learning, and distance learning. SOL has implications for teacher training, management development, and organisational learning.

INTRODUCTION

Action research carried out over 30 years in a wide range of organizations involving individuals and teams has enabled the development a conversational methodology and technology for enhancing the human capacity to learn. A quantum leap in skill, competence and creativity can be achieved and this process has been called Self-Organised-Learning. (SOL). In this chapter the focus shall be on some of the core components of Self-Organised-Learning and for those who may be interested in applying this approach within their own domains, some of the appropriate SOL resources shall be referred to. Towards the end and where relevant throughout, the unique contributions of Gordon on conversation theory shall be commented on and show how the SOL approach relates to his own; in his own words "Sheila and Laurie have added to and independently innovated in their own metaphor directions." Those who have been a source of inspiration from within an eclectic cocktail of progressive thinkers from within cybernetics, biology, psychology, quantum physics, and mathematics as well as Eastern and Western Philosophy shall be referred to. Finally, how SOL can contribute to and significantly change the world of education shall be briefly commented on.

Several divergent roots become unified within Self-Organised-Learning. We shall specify some of these.

Systems thinking, emergent biology, ecology, and gestalt psychology as well as the Tao imply a shift in perspective from parts to the whole. They give emphasis to relationships and patterns of organisation within an open system and to the balance of flow and change. Again, re-entrant feedback and complex networks within living matter capable of autopoeisis lead ultimately to self-organisation and together with chaos and complexity have formed the foundations of a new thermodynamics of open living systems. It is extrapolated that such patterns of embodiment in all living matter are also crucial characteristics of human learning. Furthermore, complex patterns of relationships in living systems are continually being transformed, increasing diversity and creativity and this is seen as fundamental to human learning. Self-organised-learning involves constantly seeking for novelty within which perception, emotion, cognition, language, meaning, behaviour, and self-generated feedback all play a part. The emerging awareness and consciousness allows us to differentiate our world, build our personal constructs and structures of meaning which become the basis of our actions. Within this psychological domain, *a process of knowing*, a growing awareness of our inner and outer world empowers conscious control, self-regulation, and Self-Organised-Learning..

The human capacity for abstract thought empowers the facility for *modeling our world* whereby personal models are constructed and reconstructed and this allows us as self-organised-learners to grow our freedom, transform ourselves and the world we inhabit. SOL-ers and networks of SOL-ers become learning entities or *conversational individuals* (C-indis) capable of bootstrapping their *capacity to learn*. This view of human learning may sound utopian but those individuals and organisations that have practised SOL have achieved some remarkable and occasionally unexpected outcomes. The problem is that most of education does not approach learning in this way and people early on become trapped within a closed system of beliefs and values, restricting their personal experimentation. Consequently, they develop an ever-diminishing and fixed view of their own capabilities as learners and of their possible futures. They become imprisoned within habitual modes of learning, sometimes referred to as learning styles, and their beliefs and values become frozen and apparently immutable to change. On the whole, the systems of education as well as the learning technologies fail to take account of self-organisation in learning. This results in a pathology of learning and a deficit of learning potential in the cultures.

Hitherto, unimagined levels of skill and creativity can be achieved if learning can be enabled within a SOL paradigm. This involves a new look at learning, implying a fresh approach to methodology and technology. The authors have come to define learning as:

The conversational construction, reconstruction and exchange of personally significant, relevant, and viable meanings with purposiveness and controlled awareness. Patterns of meaning become the basis of anticipations and actions in the world and the quality of these encounters depend on skill in generating appropriate feedback. By modeling this process, learning evolves.

The Learning Conversation methodology and technology that the authors have developed are designed to empower a Self-Organised-Learning Capacity. The anatomy and morphology of the Learning Conversation and the Taxonomy of reflective learning tools which serve to amplify the Learning Conversation have been extensively published over the last 30 years. Here emphasis shall be given to the inner and outer conversational processes involved in the construction of meaning and how the SOL-er can be seen as a *conversational meaning modeling entity.*

Throughout human history evidences exist of a search for meaning. As part of this quest, human-kind has sought to represent the outcomes of this process in a diversity of forms. The cave icons, images of stone, the monumental architecture of Stonehenge and the pyramids of Egypt, the modern Guggenheim museum in Bilbao, the paintings and sculptures of all time, the poetry, prose, storytelling, films and the videos, the scientific and mathematical laws and models, the engineering feats of bridges and skyscrapers, can all be seen as representations of a quest to seek a purposive understanding of the world. These represent in our terms *the mindpool* of our cultures. Their viability depends on the quality and imagination of their design as well as their "fit for purpose" excellence. Take any given scientific theory, technological innovation, architectural structure, a poem, play or painting, a musical composition, a botanic garden, or a biomorphic sculpture, each has been, and may continue to be valued according to the criteria addressed implicitly or explicitly, within a given culture.

When such artefacts are seen as *conversational outcomes of a search for meaning* insights are gained into the inner and outer conversations that have taken place in the human history. Each example is highly selective, enhancing some aspect of meaning at the expense of another, and represent an end point in a specialised search for understanding. The danger is that these artefacts or final forms can easily become *objects of knowledge* rather than examples of *how personal meaning was originally sought*. This *personal meaning which represents first generation knowing* is primary and has been self-organised as creative individuals converse with their world. Such personal knowing is not monolithic: rather this should be seen analogous to ecosystems, depending on purpose and context and self-generated strategies for survival and success. If learning is to be developed, then in our conversations with such artefacts of human understanding, we need to construct our own meanings rather than passively receive them as objects of public knowledge. Unfortunately, the latter case is so easily exemplified within our system of education, and learning is inevitably other-organised.

The notion that teacher or expert knows best and that to learn, one has to "successfully submit to being taught, trained, or instructed" is still paramount. The monolithic, established, and objectivised public knowledge embodied within education has to be conversed with and represented *within our own terms* if it is to become *first generation knowing.* **It is this inner conversational representation of ones meanings which is the source of personal knowing and the source of Self-Organised-Learning**. Awareness and reflection of this process allows the reviewing of the quality of this conversation and allows the growing of understanding in conversational exchange with others including teachers, coaches, and specialists. They become *the resource* for our knowing rather than icons of established public knowledge.

In this chapter, *an 8-dimensional taxonomy of personal meaning* shall be offered, as well as a

SOL *feedback for conversational learning model* in which meaning not only shapes and triggers behaviour but also creates a perceptual set, a state of purposiveness and perceptual readiness to make use of "self-generated knowledge of results". Thus, the meaning not only drives the activity but it allows for the anticipation of the consequences of its actions and sets itself a check on how well things have turned out. Within SOL, the knowing has to be personally justified. This model has been called the *SOL meaning-acting-perceiving-spiral* (MAPS). This shall be described in more detail, and how this can be used conversationally within a system of *Learning Conversations* to empower individuals and teams to act as *conversational scientists* and become Self-Organised-Learning entities shall be shown.

It shall be argued that a *conversational science of human learning* within which self-organisation is primary, opens up a new approach for education. The aim will be to encourage further debate which has bearing on the design and development of appropriate learning technologies as well as the practical applications of Learning Conversations in the wider context of education and training, coaching, and lifelong-learning, and within learning organisations.

SELF-ORGANISED-LEARNING AND THE SEARCH FOR MEANING

Each of us constructs our own personal meanings through our active, conversational engagement with the outside world and the quality of such meanings depends on the quality of this conversational process. Personal meaning cannot be received directly from others. All that is possible is for (A) to represent their meaning and (B) to construct their meaning in the presence of this representation. What B constructs may or may not be close to the personal meaning of A. To the extent that A and B are not aware of this, there remains a communication problem. Moreover, since Freud, we have come to recognise that our system of personal meaning has system characteristics which are unknown to us. Our "personal knowing" is less and different from the rich reservoir of our personal meaning. Through heightened awareness, our "personal knower" can learn to converse not only with the outside world but also with our own internal developing system of "personal meaning", so that we construct richer "personal knowings". The research experience has shown that, by and large, education has failed to appreciate that the entire perceived world is constructed by the mind and that the outer world we perceive and the underlying physical reality is not by any means synonymous.

Education insists that teachers, trainers, experts and examiners operate as if there is one "right" answer and that public knowledge provides the resource for passing on a culture's system of meaning in a fixed and authoritative mode. This has increasingly resulted in an impasse between the learning population seeking to personalise their understanding of the world so that they can act effectively within it and the educational ethos which blindly insists on a top down right answer approach. David Bohm (1994) rejects the notion that our thinking processes neutrally report the objective world. He has argued that public knowledge which he saw as "collective thought" is so automatic that we are in large, part controlled from the outside and that it is essential to endeavour to understand what meaning is and to separate this from other-organised thought and public knowledge if we are to transform ourselves and advance as human beings. Only then can we be authentic.

It is in the very nature of our humanity to seek meaning: to search for some understanding of ourselves and the world in which we live. In the Introduction it was stated that the culture of any given society is characterised by a vast array of artefacts which represent the external evidences for a search for meaning, in for example, the arts and crafts, science and technology, archaeology, literature, music, mathematics, and philosophy as well as in everyday life and that these represent the collective *mind pool* of all the generations of individuals who have contributed to it.. Self-organised-learning concerns itself with how each individual interacts with this mindpool to construct personally significant, relevant, and viable meanings and to contribute back significantly into the developing mindpool. Such conversationally acquired meanings enable effective transactions with our world made up of events, people, situations, as well as animate and inanimate objects. This becomes our system of *personal knowing*. When the conversation is focussed inwards our "personal knowing" becomes the resource for achieving insights into our own individual processes. Thus, the inner and outer conversation, together make up each persons search for meaning. Self-organised-learning is designed to empower this process. In developing SOL we have come to appreciate that both inner and outer conversations should be "Learning Conversations" in which the SOL-er chooses their resources to construct for themselves a personally meaningful world.

Equipped to develop their search for meaning through SOL, the quality of human life is enhanced and our *capacity to learn* continues to grow. This is in marked contrast to a society which educates and trains largely by pre-packaged resources which, however sophisticated, are inevitably restrictive, highly selective, and expert value laden. Such *other-organised-learning* treats public knowledge as a fixed resource, invites mimicry, and reduces the capacity to learn. A creative and flexible search for personal meaning gives emphasis to the *processes* of *learning* as well as the content of public knowledge and heightened awareness enables the individual to engage creatively. Should the valuing of this search become established, it will fundamentally change the nature of education and of the mindpool and this carries deep implications for society itself.

A consciously driven Self-Organised-Learning process consists of a system of *Learning Conversations* (Harri-Augstein and Thomas, 1991) which is designed to enable individuals to experience how personal meaning is created, thus expanding the terms in which they think, feel, and act. Listening to a lecture, reading complex intellectual matter, project work, group discussions, whiteboard interaction, observing a live demonstration or video, as well an active appreciation of the creative representations of others, from Leonardo's Notebooks, Einstein's mathematical formulations leading, or a Gerald Manley Hopkins' poem, can all lead to an enrichment of personal meaning. SOL empowers the individual to transcend such events and artefacts to arrive at a description of the processes which enabled them to construct their personal meaning through active engagement with these resources. Other organised-learners will remain imprisoned within the knowledge of others and continue to view their world as the products of others, rather than as *resources and tools to be used to enhance their own learning*.

The conversational paradigm offered by SOL provides a mode for articulating experience which can be applied to all forms of knowledge. The skilled SOL-er is free to purposefully question all existing artefacts and human resources, which become tools for developing their personal knowing. These tools are available in all walks of life, at every age, and at all levels

of sophistication, so that everyone from infancy to old age can be encouraged to converse and learn in ways which achieve greater personal freedom. This depends on support in the recruitment of the appropriate tools and on the power of the Learning Conversation itself. Entering school or university, one's first job, retraining, refresher courses, marriage, divorce, redundancy, and even retirement are likely circumstances whereby Self-Organised-Learning can support the vulnerable individual from potential disasters to new levels of achievement by enrichment of their personal meaning.

THE QUALITIES OF PERSONAL MEANING THAT MAY BE CONSTRUCTED

Individuals experience and represent their personal meaning in many forms. Meaning is expressed in the imagery of the senses; in the kinaesthetic sense of the voluntary muscles, the auditory, visual, tactile, and olfactory sensory systems, as well as the emotional and symbolic patterns of relationships mediated by language, art, science, mathematics, music, and technology. In riding a bicycle, serving at tennis, chairing a meeting, reading, lecturing, surfing the Internet, or writing up a project, for example, the emphasis given to each of these forms within the total system of meaning will vary, but each plays its part within a person's unique, multi-morphic system of personal meaning.

The use of language plays a key role since the symbolisation of things, events, people, and ideas relates richly and complexly to our sensory, emotional, and behavioural experiences. Mostly, unless we are a yogi, a fakir, Zen master, or spent years in psychoanalysis, we are only partially aware of this vast and complex system of personal meaning out of which we perceive and act. It is difficult to communicate about this with oneself or others. An obvious example is attempting to teach someone to drive a car or ride a bicycle. Although this skill is represented in the more conscious personal, knowing very little of it is in symbolic form, rather it is in the organisation of the muscle system, and their senses, in visual experience linked to balance and co-ordination, in the feel of the hand and foot, and the observation and highly selective visual appreciation of events on the road. Conversely, how we appreciate some intellectually complex resource will depend not only on our symbolic capabilities but also an awareness of the emotional and sensory experiences attached to it. Much of our behaviour is accomplished with little or no participation of conscious experience. Much of our personal meaning remains in a Polyani-type *tacit* form (Polyani, 1966) and in times of change, if this can not be made more explicit and expressed as personal knowing, it will inevitably restrict our growth. For most of the time, this personal meaning is only very inadequately represented in our more explicit personal knowing. This complex, multi-level representation of meaning involves processes that, as we shall see, primarily occur beyond ordinary awareness but can be brought into awareness by opening up a channel of conversation between our system of personal meaning and our more conscious personal knowing, so that we have a better understanding and personal more control of it.

In our action research, it has been found that attempts to elicit and represent this multi-faceted, semi-tacit personal meaning externally, in oral, written, or visual form, so that it can be reflected upon, facilitates the construction of more personally significant and viable meaning. Such representations can become *mirrors of the person in process* and conversational reflection and review enables SOL-ers to develop a deeper, more explicit, and articulated model which enriches the ways in which they anticipate, act out, and review their

personal world of meaning. *To be effective, such representations must reflect meanings in terms which link purpose to experience and behaviour.* Traditional forms of written and oral representations are almost always linear, yet shall be seen, meaning is a complex web of interconnecting structures. G. Kelly's Personal Construct Theory (Kelly, 1955) was a major breakthrough in offering for the first time a systematic method for eliciting an individual's repertoire of personal constructs free from the distortions of the public language addressed by the interpretations of the researcher. Later, it shall be seen how SOL has not only built on the repertory grid technique as one tool for raising awareness of how personal meaning is constructed and exchanged with others, but has gone beyond this to develop varieties of structures of meaning procedures which address the intricate web of personal meaning within specific contexts, purposes, and outcomes.

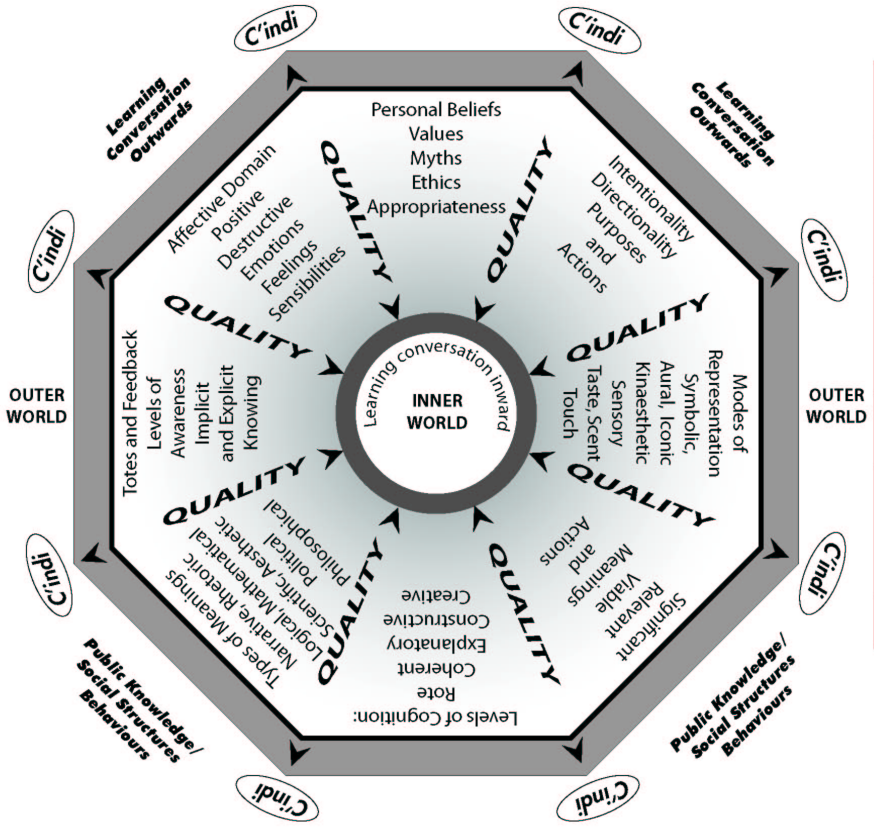
With the possible exception of early learning in nursery schools and the few learning-focussed institutions, education all too often overemphasises symbolic forms of meaning within vicarious contexts at the expense of the other forms of experience. Patterns of symbols become *ends in themselves*, abstract relations divorced from other aspects of meaning. Such a monolithic concern with symbolic understanding results in an impoverished personal meaning and ceases to be means for negotiating growth. Academic knowledge per se often falls into this trap. Unfortunately, the academic teaching community has come to believe this *is* learning, resulting in a *deficit in learning potential*, stifling innovation and creative thought processes. The educational system has constructed assessment and appraisal schemes which tend to perpetuate a self-destruct heresy. Society's youth and adults in lifelong learning are in danger of ending up as well programmed robots or other organised learners, unable to creatively engage in a rapidly changing and demanding environment. SOL allows learners to challenge the quality of their personal meanings, gaining insights into their own personal processes.

The Eight Dimensions of Personal Meaning

We distinguish *eight dimensions*, which together form the structure and organisation of personal meaning (Figure 1). There is a continuous flow within and between each dimension and this dynamic pattern of relationships provides a *dissipative structure* which organises our thoughts, feelings, and actions. Perigogine's concept of a dissipative structure emphasises the close interplay between structure and change in living systems enabling stability, change, and evolution to take place (Perigogine, 1985). Thus, each dimension of personal meaning has a capacity to transform itself into a new structure of increased complexity. As shall be seen later, this is triggered by feedback loops generated by the activities of the SOL-er.

These eight dimensions have been brought together into a new synthesis as a major tool in the Learning Conversation designed to enable the SOL-er to gain insights into their otherwise tacit personal meaning system. These dimensions will be articulated by one by one:

Fig 1. The Wheel of Personal Meaning: 8–dimensional Conversational Space



1st Generation Knowing	nth Generation Knowledge
Conversational networks ↓ 1, 2 or more conversational individuals (c'indis)	Mindpool of Cultures
Personally Significant Relevant and Viable Meanings	Collective Consensus of Public Knowledge
Contexual Personal Knowings	Taxonomies of Knowledge
Functional Individuals Teams Groups Families Communities	Societies Organisations
Conversational networks	Institutions

Units of meaning become the atoms of conversational space
Self-organised empirical experience

1

1. Levels of Meaning. In our book *Self-organised-Learning* (Thomas & Harri-Augstein, 1985), five levels of meaning that may be constructed are identified. Consider a learning event such as listening to a lecture. A student may conceive of this as copying notes as accurately as possible so that these may be learnt in a ritualistic, literal, and factual manner to be recalled later. This is called *the rote level* of meaning. This allows fixed entities such as things and familiar faces to be recognised, but does not enable the exercise of understanding or judgement. What is heard or read is treated in a linear sequence without any appreciation of the complex web of meaning which is addressed. Another way would be for the student listening to the lecture to construct a coherent pattern so that sense could be made of the lecture by considering the parts and relating these to each other. This is called the *coherent, internally consistent level* of meaning. This allows a learner not only to recognise but also to appreciate the logical pattern of the lecture. A more explanatory level of meaning is constructed when a learner relates "cause and effect," that is, if *that* then *this* is the likely consequence. The meaning becomes *operational* and forms the basis for some action. Next**,** *constructive meaning* develops as a learner actively reorganises and adds meaning from within their pre-existing experience. The learner may also explore further sources of peoples' experience derived from such artefacts as books, videos, or the Internet, which addresses additional evidences and examples, or may interrogate co-learners or a tutor to add to and elaborate their understanding. This may involve critical evaluation and extrapolation of the lecturer's ideas to other contexts . The final level is *creative meaning* construction, which involves a significant change with new insights and understandings. The nature of a learner's skills and competences may undergo a personal paradigm shift and the meanings created may take on a new trajectory, which might challenge or contradict the lecturer's presentation.

Each level implies a different intent and a different relationship between the learner's conscious knowing and the more implicit personal meaning. Each level may vary in quality and the learner would use different criteria to assess "worse" and "better" qualities. The nature of the conversational learning process which generates each level of meaning is different and is monitored differently to measure effectiveness. Awareness of such a meaning generating process allows the SOL-er to enhance their capacity for learning. The Learning Conversationalist, the SOL-er has the capacity to converse at all levels and in exerting choice. is able to construct greater freedom to grow. Personal meaning is developed in a context of understanding how purpose, strategy, and the structure and organisation of the resources will effect the outcome of their understandings and behaviours. The mnemonics and other recall tricks being practised in course work and revision for examinations are amongst the un-SOL techniques, and can only sustain at best rote, coherent, or operational learning.

2. Modes of Representation. Earlier, a case was made for the diverse and multi-morphic modes of personal meaning ranging from *sensory, enactive, iconic* and *symbolic* representations. The emphasis given to each within a given learning event will vary but each will play some part. In interacting with a whiteboard presentation on "how to dissect an animals heart," "how to set up an experiment to show that water is made up of oxygen and hydrogen in the proportion of 1:2'," "how to perform a sky dive and control a parachute," "how Einstein arrived at E=MC2," or in listening to a lecture on "the importance of Kant's philosophy for the Enlightenment," or "the various interpretations of Hamlet's Oedipus Complex," different mixes of these modes of representation will become apparent. Again,

each will vary in quality and an Sol-er learns to converse by heightening awareness of how these different modes of representation are constructed and how these relate to each other in the complex web making up their personal meaning. Lack of awareness may lead to too much emphasis on one mode which may be inappropriate for the task in hand.

Often we are only partially aware of the meaning which some thing, event, person has for us. It becomes difficult to communicate "this meaning" to oneself and to others. In each particular case the mix of representational modes will vary, and this tacit knowing is an important component of our anticipations and our actions. If this is trivialised, fragmented, or devalued in an effort to make it more explicit, then any attempt to change will become diminished. Each learning event needs to be explored in terms of its kinaesthetic sense; the meaning may be partially in the muscle sense and its organisation, its visual experience, its taste and smell, its tactile feel, its pattern of sound, as well as its verbal language. In SOL, the mix is explored and reflected on. This provides the scaffolding for change. Such meanings must be viable in a person's transactions in the outside world; transactions with public knowledge, with people, animals, and plants, and with physical objects from motorcycles, gadgetries of various kinds, clothes, bows and arrows, and kites.

Autobiographical reports from outstanding scientists and artists reveal how multi-morphic personal meaning supports the creative learning process.

Einstein:

Words as they are written do not play a role in my mechanism of thought; rather these are certain signs and images, and there is a connection between these and logical concepts. My desire to arrive at a solution has a deep emotional basis. In my case the visual and muscular plays a part and when words intervene these are more auditory.

Nietsche -In his composition of Zarathustra:

When my creative energy flows, shuddering thrills pass through me and my muscular activity is at its greatest. My whole body is inspired. I feel I am dancing in body and mind, a profound and unimaginable happiness.

Daniel Barenboim:

When I conduct, or play the piano, even a very familiar piece, its as if its for the first time. I see musical images, I hear patterns of sound, the whole of me lives the music. Music is life and we pay far too little emphasis to sound in our early years which is why images predominate, but not for me.

Learning Conversations with a personally known scientist and artist as part of a creative learning project revealed similar introspections.

> Professor X FRS, well known in the field of polymer and surface chemistry, reflected on his "private language" of chemistry: *At the creative edge I think of symbolic, structural, transitional states, time sequenced and phase patterns, in terms of imagery. I see different*

kinds of hooks on the surface of molecules, and get a feel for how they might work. I enter a fuzzy grey area requiring deep thought, I can't explain what is going on. New multi-causal, multi-dimensional simulation technologies help but they have serious limitations. For me analogy and metaphor and visual imagery and a feeling as much as conceptualisation is important. "Do you share this with your students or colleagues?" Surprised at the question -- No, never. On reflection perhaps I ought at least with my research students. There's certainly no scope for this on our undergraduate courses. I'm sure my postgrads would find it a bit odd, and maybe ... are likely to say ,.. .poor sod, he's going off his chump now that he's nearly retiring!, "You could talk about your own inventions and how you achieved these ... ." Oh Sheila! its not really scientific is it. He did not know, and I could not tell him that one of his students had come to CSHL for help and had been involved in a series of Learning Conversations at the Life Level. At 23, and having studied chemistry for 5 years, he had no idea why he had chosen the subject and worryingly he felt claustrophobic about his research project, with little freedom to experiment his own way. Professor X went on to add. May be my Japanese colleague has a different secret language to my own, which would explain why we think and work so differently on the same problem. I thought we all shared the same language for chemistry! As an afterthought ... I have to say, I always find the grey area painful, I tend to escape into my administrative duties as Head of Department.... but I do in the end revisit my grey area, often at home in my favourite armchair.

Sir Kyffin RA:
Painting for me is an obsession. I go to great lengths to avoid it. When I paint, I start in the real landscape of Snowdonia and draw what I see in my mind's eye, depending on the mood of the mountains and mine! I then use this sketch in my studio to paint, mostly in just three colours, usually dark and sombre. ***I*** *don't paint, its done for me and I have this huge energy and I always finish my work in one long day. I love the Fauvists with their wonderful colours but for some reason my paintings, they say, carries angst. I would need to be psychoanalysed to discover why. Let's look back on some significant experiences in your life……...Ah! Sheila if I reflect……. I seam to have, since I can remember, lived with uncertainty, in my upbringing when I was scolded by mother for the terrible drawing I had made of my brother, in the army when I was asked to leave because of my epilepsy, in the Slade School of Art when I was told I could not draw and I could only stay for a year. And, I remained a bachelor after my first proposal of marriage was refused by her father! All I can say is -- I live through my painting, though I resist it. My compulsion to paint is a big burden for me, I leave it to the last moment, till the light is fading When I paint in my studio its like setting up a circus tent, bit by bit till the whole thing is taught and balanced. I always stand and I start off being very aware of the mechanical steps, but when things come together I loose all awareness until I can say it is done. And unless I can feel love for the image I see in my mind's eye, I don't try..... But I am very happy though surprised that so many people love my work.*

3. Types of Meaning Representation.
With reference to the lecturing example, an analysis of the lecturer's presentation can reveal the type of meaning predominating in the text. This may be partly anecdotal, an amusing story or narrative, a *logical* treatise, a *mathematical* proof, a *scientific* account, a *historical* document, a *political* or *philosophical* argument, a text laced with *humour***,** an *aesthetic*

poem, *musical* notation, extracts from a *mediaeval* or *religious* manuscript, or a piece of *rhetorical* prose. These are only few of the types of representations that can be addressed in text or in any oral communication. The type of representation can be regarded as a language in its own right, with its particular rules and structure. An examination of Cicero's volumes on the rules of rhetoric, for example, show how these rules can be used to emphasise particular meanings within oral or written representations. These provide abundant evidence of the hidden influences embedded in different types of communication. This tome shows how to dress a particular message in ways which convince; how to persuade, invite, justify, empathise, command, argue adversarially or inquisitorially, are just few examples. The much hyped commercial advertisements that overwhelm us represent insidious, hidden examples in our culture today.

Each type of meaning representation will influence the understanding generated, and the quality of each, determined by the rules being practised, will influence the personal knowing . The medium is the message is a much used slogan, yet an appreciation of what this embodies is a rare occurrence in practice. Awareness of the level and mode of meaning representation as well as the type will together influence the richness of the personal meanings that can be generated.

4. Affective Meaning. The affective domain has long been neglected in the educational system. The range of emotions and feelings of destructive and positive nature will influence the levels, modes, and types of personal meaning. Let us look again at the lecture situation. A student's feelings about the lecturer, how the person is perceived, will gradually come to affect level, mode, and type of meaning generated. The lecturer may, for example, have been highly critical or taken a authoritarian stance in interaction. The student may be sexually attracted to the lecturer and may have developed fantasies about a possible relationship. Alternatively, the student may be very excited about the subject matter or keen to derive pleasure from what may be a novel event. Often, learners are not aware of the extent such emotional reactions may govern their listening or reading and impact on their personal meaning. Hate, jealousy, anger, anxiety, disgust, boredom, joy, excitement, and transcendental emotions will differently affect the quality of their learning. The introspective accounts described earlier in "modes of meaning," show how emotion is intimately linked to each of the eight dimensions to give a coherent representation of personal meaning.

The recent surge of interest in emotion in the psychological literature is leading to a re-evaluation of the role of emotion. The development of complex multi-level models of emotion which influence attention and awareness go way beyond Freud's conceptualisation of unconscious drives. Paul Ekman (2004) has identified five basic emotions that have recently been linked to dedicated brain circuits, and a major research question for education and learning should be how emotion of both destructive and positive genre influences the range, depth and quality of the meanings that can be generated.

The seminars organised by the Dalai Lama explores this theme on a broad canvas (Coleman, 2004). Destructive and constructive states of mind were identified, which range from low self-esteem, overconfidence, jealousy, doubt, anger, envy, and lack of compassion, for the former, to self-respect, generosity, goodness, love, and friendship, for the latter. The cultivation of "mindfulness," which SOL has interpreted as reflective awareness addressed in

the MARRRRS heuristic, described later, is according to Buddhist practice, a way of learning from the direct experience of emotion. This frees the mind and enables a transformation of destructive emotions into positive qualities. The Dalai Lama goes on to state that learning from experience requires perseverance, diligence, and skill .and this strengthens the positive qualities of the mind. He then goes on to say that to learn to better understand what is destructive in emotions, and so learn to control them, is something every human being has the capacity to do. Education is an imperative he says, yet, what most young people are exposed to is information and instruction that will enable them to get a job and fit in.

One big question that emerges from the seminar is: where is education and research into developing the mind? Varela was concerned for the need for precise techniques to explore subjective experience, and that this would benefit scientific method as a whole. Since William James and Husserl in the Phenomenological tradition, emphasised the "first person account" of empirical experience, the method has remained vague and obscure. The Introspectionists were accused of soft psychology, and this laid the foundation for Behaviourism, which dominated psychology for several decades. It is hoped that it is not too arrogant to state that one of SOL's significant contributions to the psychology of learning has been to have refined self-talkback by developing high tech and low tech tools, for eliciting experiential representations and for recording behavioural records, which together in a Learning Conversation become coherently linked by the learner and related to a particular event, in a given context, and to the purposes, strategies, and outcomes of the learner. The learner is encouraged to justify the quality of this process in his or her own terms. This produces an explicit qualitative account, which can then be evaluated by the learner and significant others in the learning domain.

5. Personal Meaning and Intentionality. A sense of purpose is integral to any human activity and different interpretations exist of how this is conceived. Within Eastern psychology the person is seen to be "in flow" and in a constant state of change. Intentionality is embodied within "karma,"which can be interpreted as both beyond the person and yet uniquely influenced by the actions of the individual. Jung, seeking to understand the science, embodied in the I CHING (Baynes, 1951), conceived of a process of "synchronicity" (Jung, 1972) as an acausal phenomenon generated by the coincidence of events in time and space. This is beyond the boundaries of "cause and effect" where chance may play a part, but this is interpreted as an open conversational process and integral to the relationship between the intentionality of the individual and their life space. Within humanistic psychology, the person is conceived of as being "in motion," whilst requiring support in overcoming obstacles to their self-actualisation, growth, and "flowering." For Maslow, a person's intentionalities are addressed in a hierarchical system of *needs* from physiological to psychological (Maslow, 1975). For Rogers, directionality and purpose can be consciously and internally generated and becomes the responsibility of each person.

Varela (Maturana & Varela, 1980) has delivered a natural science axiom that all living matter maintains itself in a state far from equilibrium and its dynamics include a spontaneous emergence of new forms of order at points of instability. "Emergence" is recognised as a phenomenon which allows for the directionality of growth, evolution, and creativity. Life itself can be seen as an open system within which learning is a conversational process between living entities and their environment. *Perturations* from the environment trigger

changes but living systems have a capacity to specify their own changes and to select which perturations trigger them. So, living systems bring forth their own unique world . They converse with the world and this gives rise to further conversations which generates self-amplifying feedback loops. Luhmann (1992) describes living entities as networks of conversations with multiple feedback loops within which a shared system of purposes, explanations, beliefs, and values develop. Creativity is a key property of life as it reaches out for novelty and a *learning culture* is required to nurture a network of such conversations providing freedom to learn through observation, reflection and experimentation.

Within the cybernetic literature, the experiments with the Grey Walter Tortoise offer a clear explanation of the relationship between behaviour and purposiveness. By simulating error actuated feedback, the movement of the machine tortoise and the dance of a pair of machine tortoises demonstrated that purposiveness is integral to any feedback system, and not a teleological "add on" to process. Purposiveness can be explained as a feedback link from a person's personal meaning system guiding their anticipation and behaviour. As shall be seen, a multi-level feedback system which can be monitored, changed and self-generated by a self-organising entity, can go a long way to explain how purposiveness is integral to anticipation and action and is an intrinsic component of a person's personal meaning. Laurie Thomas (Thomas, 1984) one of the authors, has expanded Kelly's corollaries, formulated in his theory of personal constructs, to include three new corollaries accounting for a person's purposiveness.

Directionality Corollary:
The pattern of perceptual selectivity inherent in the construction of experience of an event guides behaviour. The cybernetic loop generates directionality in both behaviour and experience. Directionality will encompass a certain range of events and will exhibit certain coherence over time. This function relates to the events themselves and to the construction of experience of their replications.

Intentionality is seen as the *awareness of directionality*. Passive directionality is one of the hallmarks of other-organised learners and whilst they may be able to express an intention, they may well not achieve it. Their purposes, in a sense, do not belong to them and unless told how to achieve them, they may fail since they have no control. Their anticipations and actions are limited by hidden directionalities. Awareness enables the SOL-er to systematically review how they are constructing their experience and to engage in the construction process. They are thus able to control their own directionalities achieving meaningful intentionality.

Awareness Corollary:
To the extent that a person construes their own constructions of experience they acquire consciousness and to the extent the person construes their processes of construction they acquire more complete awareness.

Intentionality Corollary:
A person achieves intentionality by awareness of their directionality. Active intentionality requires sufficient awareness of the process of construction to intervene and control the directionalities generated by it.

Paradoxically education is almost exclusively directed by intentionalities external to the learner, based on formal structures and values instituted by government policy and subject matter experts. Motivation and purpose is seen as a process governed by forces outside the learner and there exists an expectation that learners should "submit to being taught" the curriculum, designed and examined by experts. The vulnerable and often de-motivated learner becomes a hapless victim of others' intentionalities and there is evidence that when offered freedom to learn, their impoverished repertoire of purposes limits the directionality and quality of their activities. When supported within a Learning Conversation to explore a wider range of purposes and to channel these into effective, self-generated strategies, their motivation becomes limitless and the quality of their learning and personal meaning becomes enhanced. A progressive approach to education welcomes a conversational methodology which allows tutor and learner to exchange and negotiate purposes for learning, empowering personal growth within a personally meaningful framework The SOL-er expects their purposeful learning to be justified within a range of criteria which become conversationally generated with awareness, so taking on more responsibility for evaluating the quality of their learning.

6. Implicit and Explicit Personal Meaning. Much of what we know becomes implicit and non-conscious, personal meaning. Yet, this meaning conditions our thoughts, feelings, and actions. We have little conscious awareness of, for example, "how we breathe," "how we walk," "how we think," and importantly, "how we learn." In crisis situations such as failing an examination, divorce from a partner, losing one's job, or becoming physically disabled, we do not know how to set about to relearn and to reconstruct our life. We have a conversational deficit in tapping our inner world of experience and often personal stress is the outcome which makes matters worse. We can not hold everything we know in conscious awareness but it is critically important to be able to tap into our implicit knowing, bring this into conscious review, and develop our personal knowing. Such meaning may be partly, in the Jungian sense, "archetypal," existing as memories of our historic past. It may also be partly in our genes. Within Self-Organised-Learning, a practical stance has been to consider that much of what we know emerges from empirical experience. Action research has shown that disempowered learners fail to develop awareness of how they learn, so that much of what they know does not, in a sense, belong to them; in submitting to authoritarian control they have at a literal level of personal meaning passively accepted from the "first, second, and third generation" knowledge of others. They lack a capacity to unravel this as a process whereby higher levels of meaning, such as coherent, explanatory, constructive, and creative, can be generated. Their knowing is *implicit* and remains locked in unawareness. They are prisoners of their own robotic knowing and behaviour. SOL insists that personal knowing has to be actively generated in awareness and has to be *explicitly* addressed during the learning process. Explicit knowing which then becomes implicitly functional is part of this process. So how can this be achieved?

Miller, Galanter, and Pribram's TOTE model (Miller, Galanter, & Pribram, 1960) is an useful explanatory tool which has been recruited into SOL. Here, this will be elaborated on, as this is crucial to the interpretation of heightened awareness and MAR4S, described later. Take an obvious example such as learning to play tennis or to drive a car. Elsewhere, what is involved in becoming more highly skilled, competent, and creative, has been described in detail (Thomas, 1991). Feedback loops are continuously changing as the hierarchy of skill

develops. These begin at the kinaesthetic level as the sensors in our muscles feed information to our brain, which monitors the speed and motion of our movement. This gradually and unconsciously informs the skilled tennis player how they are performing as they are performing. Their kinaesthetic meaning system referred to earlier as a the mode of meaning, implicitly knows how to recognise the feeling of a good stroke. The skilled player has actively learnt from experience. They have already constructed a rich repertoire of meanings. They possess a kinaesthetic imagery and integrate this with the other seven dimensions of meaning to construct a mental model suited to their performance. Once a learner can recognise this process and develop effective ways of conversing about it, they can continue to learn and develop more effective performances.

Skill results from being able to attribute meaning to events in ways that enable one to monitor and recognise when to do what and how to control one's actions in a precise and well timed manner and allows one to recognise continuously when one has successfully achieved one's purpose and to intuitively know when to move on. Past experience has generated patterns of meaning expressed as a mix of sensory, iconic, and symbolic representations as well as some or all of the other dimensions of meaning, and when triggered into action the mix is "right." SOL uses various behavioural recording techniques to heighten awareness of this process. Examples of reading, listening, problem solving, writing, discussion, and thinking logically or imaginatively, are some of the skills which need to be learnt in awareness so that the operational skills in the outside world can grow effectively. Levels in a system of TOTE units operate one upon the other and combine into an organised skill. Each TOTE is equivalent to one feedback loop. The first Test triggers the Operation of the loop and the second Test provides the perceptual set that monitors the result. If this is judged to be satisfactory, an Exit signal is sent to a higher TOTE unit and performance moves on.

There is a fundamental difference between a error-actuated feedback loop described in the Grey Walter Tortoise example earlier and multi-level feedback loops addressed within a TOTE. The difference in the timing between loops gives a patterning of activity as in the playing of individual tennis strokes right up to completing a 2 to 3 hour game. There is yet another difference when the feedback connections are many to many, so moving beyond the idea of the feedback loop altogether. Edelman (1992, 2004), introduces the idea of *re-entrant feedback* as a key concept in how conscious control can arise in the brain. Here the feedback consists of numerous connections between one system and another. He offers a neat model of primary and higher consciousness with his re-entrant principle and this offers a brain/mind mechanism for how the personal "knower" can converse with the all-encompassing and implicit personal meaning system.

The SOL-er is able to move up and down in conscious awareness between levels in the overall pattern. By bringing one component and then another under review and then experimenting how each component can be recombined into a more effective pattern, learners can effectively improve their performance. This requires tools for generating feedback about various aspects of the process so that the SOL-er can monitor their pattern building activity. The act of observing and reflecting generates a language to converse about this process. For most of us there is a discontinuity in the pattern and we lose a sense of purpose and remain unskilled. Describing one's skill to oneself in this way is a powerful aid to learning. Reflecting on how personal meaning develops in relation to skilled performance enables a

learner to refine and perfect their skills. A functional taxonomy of reflective tools designed to enhance awareness of how personal meaning and action form feedback loops which drive skilled performance, has been developed. The Learning Conversation brings these together to support this learning process (Harri-Augstein & Thomas, 1991). Many forms of representation can be recruited and those who are into computer programming may consider Visual Basic or the more object orientated programming as logical structures to develop awareness, others may use video-records of performance, whilst others may use Yoga or Meditation as powerful tools. These can become learning aids to conversation with ourselves and others to enhance the structure of our personal meanings. The Learning Conversation is a vehicle for the experiential personal meaning model to be reviewed through a whole range of reflective tools, enhancing its quality.

Pointcarre's introspective account of his creative learning reveals the hidden relationship between implicit and explicit knowing.

The unconscious or subliminal self plays an important role in mathematical creation. The subliminal self is by no means inferior to the conscious self. It knows how to choose, how to divine. It has no limitations. The unconscious phenomena, those susceptible to becoming conscious are those which directly or indirectly affect most profoundly our emotional sensibility. The harmony and elegance of numbers is an aesthetic feeling. Consciousness alone will never know them in entirety. There is a role in preliminary conscious work- it mobilises the process, but after this shaking up period, the elements freely continue to dance. The conscious and subliminal self are in some kind of communication with each other. The fruits of this work is a point of departure for the discipline and will for arriving at the new mathematical calculations. In my unconscious self, liberty reigns supreme. This disorder gives birth to unexpected combinations. One is present in the unconscious work made partially perceptible to the unconscious.

For him creative learning involves a conversation between his implicit and explicit knowing.

7. Personal Myths, Values, and Personal Meaning. Life's experiences are reflected in our personal repertoire of beliefs, myths and values. From childhood onwards a set of values which may change over time and will colour our learning, will be developed. The social environment conditions our values which are often locked in a state of unawareness. A student believing in a creationist view of life will reject any resource which offers a Darwinian, Natural Selection approach. Or, a belief that "I cannot do math," disables a student learning statistics, as part of a psychology course. Elsewhere, Harri-Augstein and Webb (1995) have described a Taxonomy of Personal Myths which condition and shape the personal meaning each person gradually and mostly unknowingly construct. Some rigidly held myths are often expressed as facts, which explain away incompetence. It is implied that such facts are inborn and not much can be done about them. Such myths are often only dimly recognised and much hard evidence and support is required to open up the mind and entice learners to experiment a change in their mind set. "I have not got that kind of intelligence," "my personality does not suit that type of task," "I cannot do math," "I do not have the talent for singing, drawing, writing an essay, or chairing a meeting," "its against my nature to …," are only a few of the myths that can inhibit and limit the meanings constructed. Lack of awareness imprisons learners and these myths can disable them to the extent that they may

become de-motivated and give up. The converse can also be true, positive personal myths will enhance motivation and influence the quality of meaning generated. Some easily identified personal myths are about the physical and social conditions for learning. Others are more concerned with processes and skills of learning, and these are only partially recognised by learners who appear to be locked in a conceptual void, unable to describe and identify their own myths that condition how they generate their personal meaning. Lack of awareness can only result in becoming living fossils of past experience. The repertoire of myths influence the values constructed and overtime solidify, become apparently immutable, and fix our psyche in space and time.

People find it difficult to stand back and check out their myths and values that constrain their thoughts, feelings, and actions. They do not have a vision of what these might be. C. Rogers has shown how learners can be offered opportunities to explore and develop their own system of values and to learn how to trust their own processes through "unconditional positive regard, congruence, and empathy"(Rogers, 1971). Only then are they capable of transforming the quality of personal meaning they can create. SOL-ers are encouraged to monitor and identify their personal myths, values, and beliefs in the "Life-Level of the Learning Conversation," and to challenge their usefulness as they engage in their educational and life activities. Their system of beliefs and values are then seen as a temporary scaffolding which can be dissolved and reconstructed to optimise the quality of personal meanings which they can generate in different contexts. Derrida (Gasche, 1986) in the *Tain of the Mirror* presents a deconstructionist and relativistic view of "knowing," which has challenged the absolutist and dogmatic beliefs of some philosophers and literary experts. It gets behind the mirror and questions the very nature of reflection and of meaning. In SOL, a construction-deconstruction and reconstruction of what can be known in given contexts opens up new possibilities for the personalisation of meaning and for how public knowledge and personal knowing relate in ways which open up new avenues for a learner's personal myths, values, and beliefs.

8. Significant, Relevant, and Viable Personal Meaning. When each dimension of personal meaning synchronise within human activity and a conscious awareness of this continues to grow, then a new species of human learning begins to emerge. Within Self-Organised Learning, this has been defined as the conversational construction, reconstruction, and exchange of *significant, relevant, viable meanings* with purposefulness and controlled awareness and the pattern of meaning constructed become the basis for all the actions in our world. The significance depends on how this fits within the values and beliefs of the person. The relevance relates to the intentionality and how this plays out in the repertoire of purposes. The viability is justified as part of this process to be tested out in the effectiveness of the outcomes achieved. The SOL-er identifies the criteria for evaluating competence in terms of how well they have articulated their purposes, explored all possible relevant resources, and carried out effective strategies for achieving effective outcomes from within their own system of values and beliefs. This is primary, but once this is achieved the SOL-er's values are open to negotiation with significant others, be they peer learners, tutors, and experts, to expand their criteria and grow their values, whilst remaining true to their own personal knowing.

Tests and examinations that exclude the learner's own criteria can only serve to evaluate an

"other-organised learning" mode. This feeds back dangerously to imprison learners within a at best, rote, coherent and explanatory level of knowing and the maverick learner that strays beyond this boundary into constructive and creative levels of personal knowing may well be in conflict with criteria used to evaluate their success. The wholesale plagiarisation of best or model answers readily available on the Internet, and the problem this causes in course work and the examination system serves to emphasise the need to rethink what exams are for and what they are designed to measure. SOL approaches evaluation as a multi-perspective conversational system within which learners and significant others within their domain of learning all negotiate the criteria for a learner-centred assessment of the quality of learning (Harri-Augstein & Webb, 1995). Personal Learning Contracts, SOL Spreadsheets, Personal Learning Biographies, and a Feedback-For-Learning Package are integral tools for a Conversational Evaluation System within the Learning Conversation.

The Fully-Functioning Eight Dimensions of Personal Meaning

The pattern of organisation characteristic of the wheel of personal meaning has been outlined. The flow within and between each of the eight dimensions is dynamic and complex and may involve implicit and explicit processes. Within a Learning Conversation, meta-awareness facilitates an enrichment of personal meaning, as well as effective anticipation and action. Ultimately, a transformation of the dissipative structure, making up the eight-dimensional wheel results in a new order of complexity. Pointcarre's account of his creative learning process, presented earlier, captures at least partially, this process. His account continues:

It involves not making useless combinations and I have the feeling, the intuition, of the order of my thoughts, so as to perceive at a glance my thoughts as a whole and then the elements in my thoughts take their allotted place without any effort of memory. A moment of attention beyond the ordinary, a sudden illumination of the whole. This reveals an unsuspected kinship between known facts and a feeling, for the time being, of absolute certitude and beauty follows my inspiration. My problem has been solved.

For David Attenborough the aim has been:

to capture the wonder and magic of Nature and to share this with the public. I have put the whole of myself , my thoughts and feelings, and my ambitions, most of my life into this enterprise and the BBC technology has allowed me to express my wonder through the eye of the camera. I try to convey the excitement of nature through my captured images and my storytelling. Even at 80 years I am never still, I am always living in my wonderful experiences of Life on Earth and planning my next venture.

For Daniel Barenboim music shows the fluidity of life, past present, future all in one with absolute open-ness: *music is my metaphor for life, all the range of my thoughts and feelings can be expressed through music. I practise consciously, and emotions, skills and what I know come into my play, though this is never mechanical, nor routine. I always strive for that elusive something. It does not come from nowhere. When I am in free flow I enter into a state of "conscious naivety," explicit becomes implicit with awareness*.

These inspiratory mavericks in the society are natural Self-Organised Learners, who have

developed their capacity to converse with themselves in ways which empower them to enrich their personal meanings and to act effectively in their chosen world.

A model of a fully-functioning person in flow in a Quantum world of constant change signifies that there is no enduring absolute truth. As in Zen and the Tao, all we can do is "seek to learn and be happy in the striving." Jung saw creative learning as the absolute antithesis of reaction and "will forever elude causal human understanding -- it can never be wholly grasped but it can be richly described in all its manifestations." The eight dimensions of personal meaning represent manifestations of this learning process and the MAR4S Learning Conversation amplifies the capacity to seek a richer understanding.

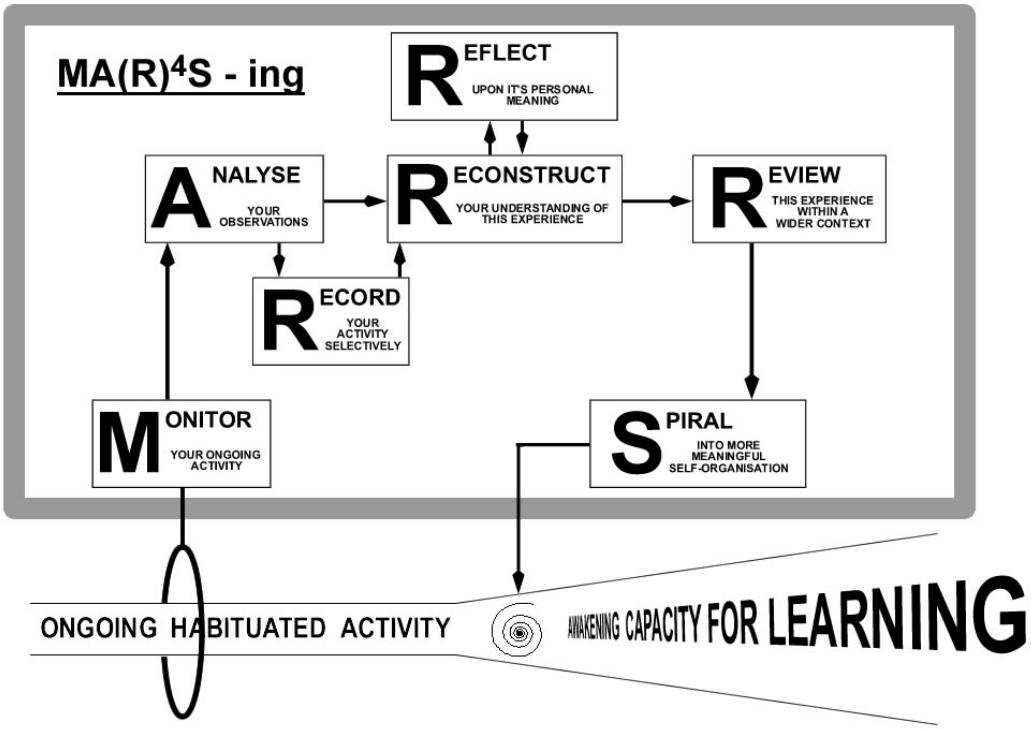
CONVERSATIONS WITH OUR OUTER AND INNER WORLD

When the reflective conversation is orientated outwards, the referent for developing personal meaning is the outer world.

When this is focussed inward then the referent becomes the inner self. One deeply inner-orientated model is Zen or yoga-like meditation in which the whole intention is to free the mind not only from action in the world but also from actions inside the body. However, this is not the domain for this chapter but it leads to the consideration of what happens when conversation is turned inwards and the referent becomes the self-generated system of personal meaning. How can we learn to model this internal meaningful world so that we may reflect upon it? This will reveal to us the quality of our own constructions generated in our anticipations and actions in the world. The inner and outer conversation forms a *symbiotic partnership* and interconnect in complex ways. If a given individual is living in a physical paradigm of "cause and effect" at the literal, coherent, or explanatory level of meaning, and constrained by personal myths and values which do not truly belong to them, then their model might have a very short and inadequate time-span of validity. How constructive or creative might such a person become? We need to learn to converse with this inner world to enable it to grow. A MARRRRS (MAR4S) heuristic which is designed to develop a harmonious and coherent relationship between our inner and outer conversations to enable us as SOL-ers to become more fully-functioning beings, has been developed. Figure 2 illustrates how MAR4S offers the learner access to an inner world and how through a reflective conversation with their outer world, they can be enabled to grow.

The MAR4S conversational process has been described fully elsewhere (Thomas & Harri-Augstein, 2001; Harri-Augstein and Thomas, 1991). Here, to convey in outline how it works, this is summarised. M--monitors a process in action by raising it into conscious awareness and *observing it.* A--runs a record of it in ones mind to note its significant features in terms of thoughts, feelings, and actions. R1--stands for an external record which allows some reconstruction of activities and intentions. R2--supports a reliving process whereby the original experience is experienced in its purest form as a whole and without evaluation. R3--encourages the exploration of possible alternatives within the process and to reflect on what was thought to have happened at each stage. Mismatches are examined and successes and failures assessed. R4--takes this process further and identifies criteria for improvement and reconstruction so that more effective outcomes can be achieved. S--Opens the conversation so

Fig 2. The Conversational MA(R)^{4}S Heuristic



that new learning does not repeat the old learning but uses the evidences from the MAR4S conversation to grow and spiral outwards

MAR4S is fundamental as a conversational vehicle for SOL. It underlies the methodology of the Learning Conversation and all its Reflective Learning Technology. The outer and inner MAR4S Conversations of Self-Organised-Learning are outlined in Figure 3. This shows the intimate relationship between them in the constructive and creative process of self-organised knowing.

When the reflective MAR4S conversation fails to take place personal knowing is diminished and may be replaced by other-organised-knowing. Such persons are no more than robots, clones of "others knowings" and are victims of second, third, and n-generations of undigested public knowledge. The danger of other-organised knowing can be better appreciated once this self-organising process is understood. Figure 4 shows the emptiness of personal knowing when the conversation is asymmetric and driven from the outside. It is considered that such non-creative conformity is disabling and that stress and rebellion are the inevitable outcomes.

MAR4S is an iterative, conversational process and with experience the SOL-er spirals towards "the edge" of what they explicitly know and beyond, into the abyss of chaotic, raw experience where implicit knowing predominates. Its power of reflectivity invites the learner into that timeless space, a place of instantaneous process, where "purpose" is temporarily suspended and events are free-flowing. A place where hitherto, the only partially explained psychological phenomena of "intuition," "insight," and "creativity" are generated. This is the place where uncertainty rules and where high energy and instability seeds authenticate and imaginative discovery. A place where "perturations" initiated through practice of the MAR4S heuristic trigger "structural changes" with the emergence of a new order of knowing and complexity. A personal paradigm shift takes place, represented by a transformation of the personal meaning system. It brings forth a new psychological world.

Here are a few extracts, or "units of meaning" elicited during hundreds of Learning Conversations with young and adult students, apprentices, managers, officers from the Ministry of Defence learning complex tasks, company executives, researchers in the field of science, supervisors, postmen and women, and Olympic athletes in training. What they all have in common is their deep and personal involvement in improving their Self-Organised-Learning abilities. These have not been categorised in any way to convey the immediacy and spontaneity of their responses. These extracts are outcomes of a MAR4S conversational process. Within the Learning Conversation as a whole, they form part of a deep exploration of personal meaning.

- I feel a surging chaos of the unexpressed
- I feel a vague urge to shake myself
- It takes courage to yield to the indeterminate
- It seems to me that the process becomes the creators fate
- I feel a dissatisfaction with current order of the subject
- In a tricky "anger" situation nothing in my training helps, in the end you are on your own
- Process and outcome are at first likely to be eccentric

Fig 3. The Outer Learning Conversation and The Inner Learning Conversation

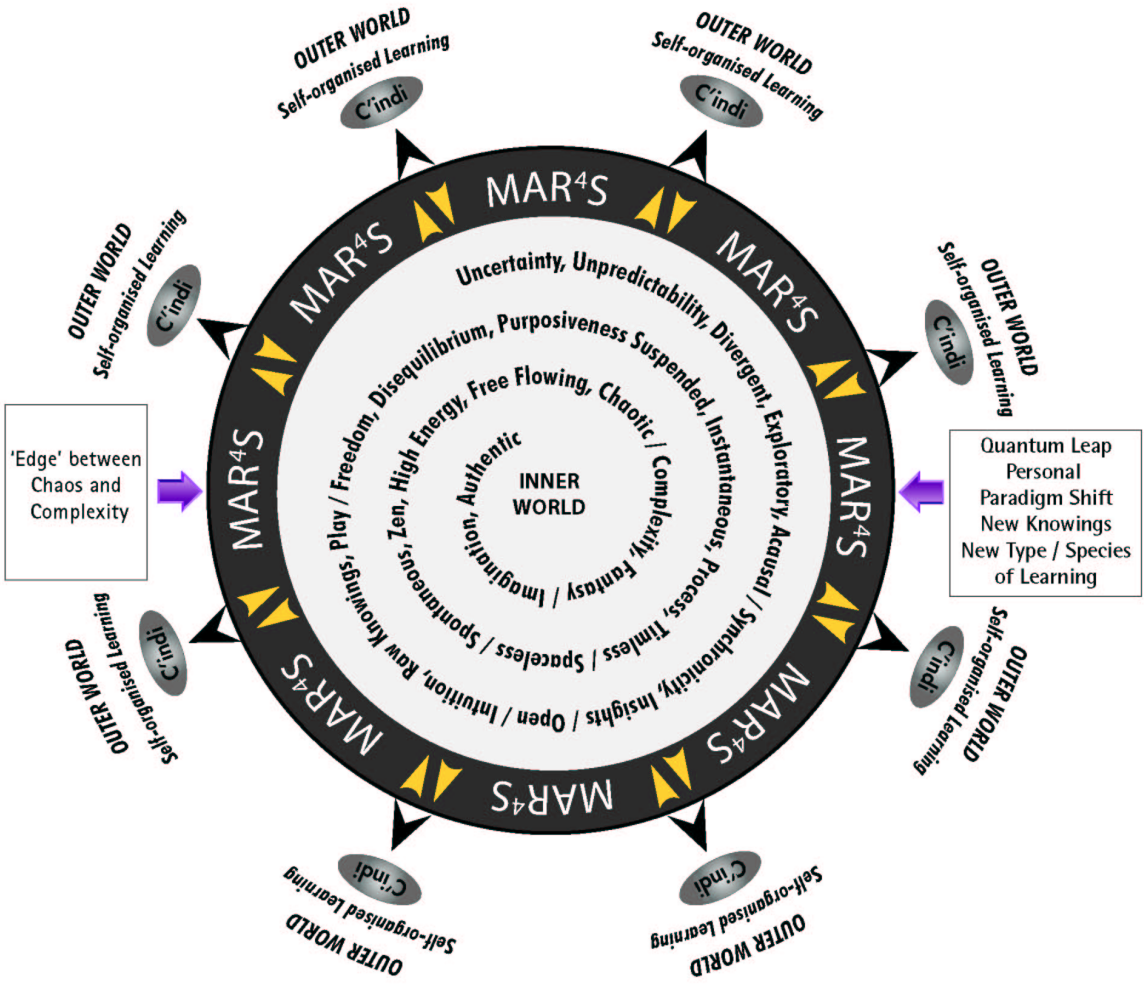
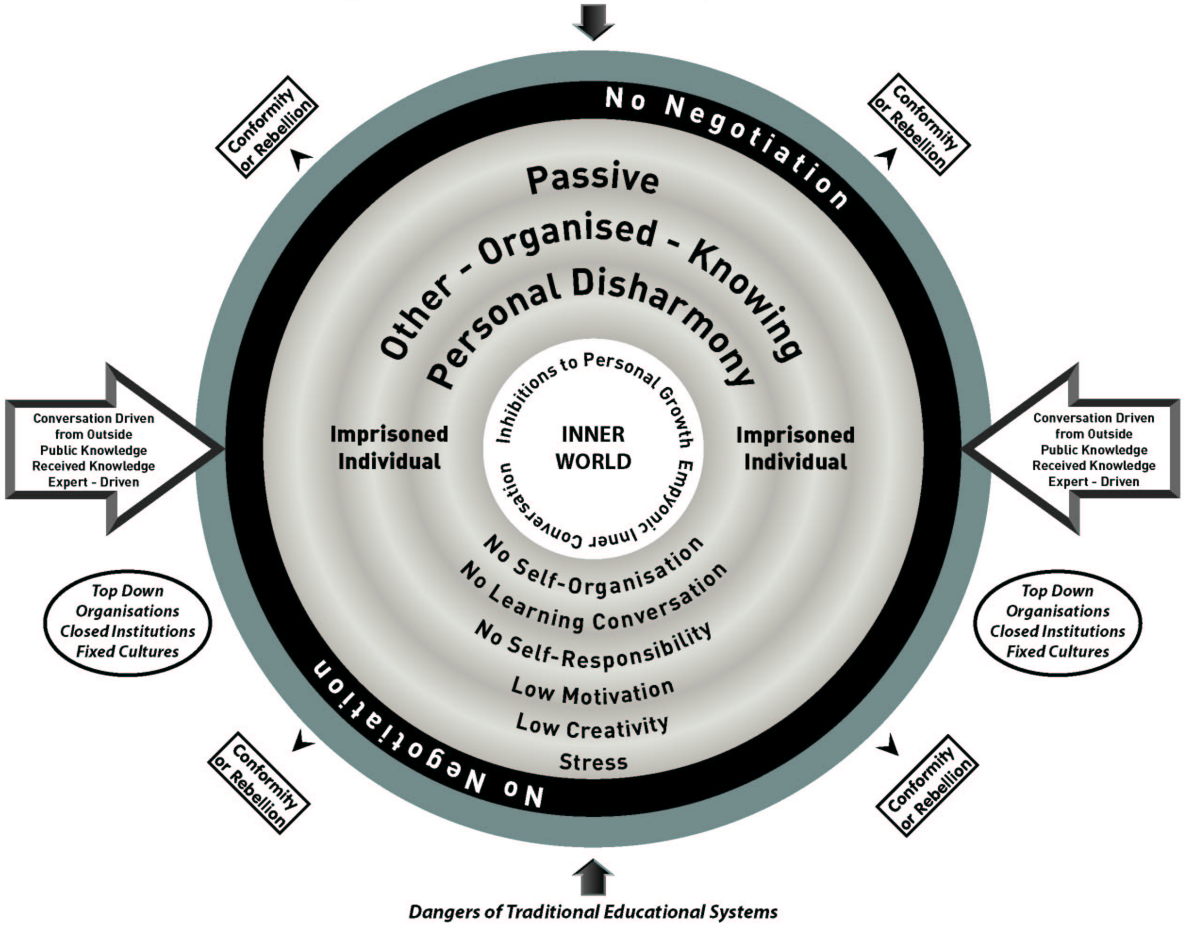


Fig 4. The Personal Emptiness of Other-Organised Knowing



- Requires a profound shift in my inner life and in the outer forms in which my life finds expression
- It's a movement beyond the established
- It's a dim cloud
- It's muddled suspense
- This verges on the religious, I don't want to surrender to an inner necessity
- I feel a germ to be developed
- Can it be oceanic consciousness
- I talk to myself as I do my jobs, and am asking why, how, if, am I going mad
- At 47, for the first time I recognise the spread of my subjective life
- My conscious knowledge and my unconscious knowledge are not together
- I feel an opposition between the new and old
- I feel a sense of limitless adventure
- I feel a great deal of stability which interferes with learning a new skill
- I feel blinded with fear to go forward without a fixed method
- I distrust the fluency of my mind, it's not scientific
- My plan must come/emerge out of my development
- I now see how my purpose can guide my tactics and strategy effectively
- I need to know my purposes much more clearly
- I am beginning to invent my own criteria for assessing my performance -- it's hard
- I need to think of alternative ways of tackling problems, and test these in my imagination
- I feel full of sludge if I can't exercise my body and my mind
- In challenging my robot I am moving into the unknown
- Why did I say I could never learn that
- I'm not old but full of robots and its hard to change
- I now can allow things to fall together of their own weight and form
- Work on this requires effort and will
- Must find out if it serves experience in an useful way and to this end must be tested critically By me
- Requires terrific hard gardening
- If process remains an agonising fumbling search then morbid conditions prevail
- The old way is cosy but I'm ready for an adventure
- I shall try to convince my boss of this, I can show him that I am better in my job
- I don't know how I learn from the computers in school, but its really cool
- My teacher doesn't want me to think, but she is kind hearted and I'll try to explain to her
- First I mark it then I take my work home and ask my mum or dad to mark it, then I get my friend to mark it and then my teacher marks it and then I try to understand the differences
- I listen to my teacher but now I decide for myself
- What goes on in my head as I listen is fantastic
- I thought my memory was a container and to learn something new I have to throw something out
- My purpose for…… lies in a nested set of purposes and I see a link with my

prejudiced views on the topic

- I want to experiment with strategies for reading for my next PLC
- I had no idea how I actually listen till now
- I have never thought about a language for learning
- In the Navy, you either sink or swim and training is the same as learning
- Sharing how we learn together leads to trouble
- Our purposes and strategies are not the same
- We understand the same task in different ways
- We need to shift from a takeover to a creative shared understanding
- Team training is not the same as learning in a team but our boss can't see this
- How can I get him to see that debriefing is not the same as MARS-ing

This is the closest SOL has come to the Zen experience of enlightenment but is experienced as a *vision of one's own capacity to learn*. This insight can only be explained as a different way to model the experience of learning and to be empowered with a new capacity to learn; to be able to stand outside one's learning and explain it in a new way, at the same time recognising that as the learner is in perpetual motion and in flow this is an ongoing process without end. Our friend and colleague Gordon Pask entered this world differently. The formality of his mathematical language and his understanding of cybernetic processes took him to the "edge" but beyond that he used to, at night, go into his garden in Richmond, London and in his own words "talk to the fairies." E. Laszlo (1996) explains this as a vision of memory-filled interconnected and self-creating cosmos and a fathomless whispering pond. Penrose has argued that new physical processes are at work in the brain and a theory of everything has to embrace Quantum theory and classical theory in a way that accepts that "minds matter" and that "mind interconnects" (Penrose, 1994). Progressive thinkers from Penrose, Edelman, Feynman, Laszlo, Davies, Lovelock, Bohm, Copra, Varela, and the Dalai Lama have all argued that there is a new vision of an *emergent and extended science*, as an open system, and when faced with puzzles and paradoxes new more enlightened paths of enquiry emerge within it.

MODELLING MEANING, FEEDBACK, AND META-AWARENESS: AN OUTLINE MODEL OF SOL

Now the SOL model developed by bootstrapping theory building and practice in our action research projects will be briefly examined. It will begin with the perceptual level of a learning activity and then introduce the notion that to become a self-organised learner the individual needs to act as a *personal conversational scientist*. The term C-indi has been introduced as a descriptor for this.

The Meaning-Acting-Perceiving Spiral (MAPS)

The quality of the conversation shapes the personal meanings constructed and influences what we perceive, and how we act. This process of constructing meaning by conversing with ourselves about our experience can be seen as "Modelling our World." This enables us, in a Godel sense, *to stand outside* our personal system to try to explain it to ourselves (Godel, 1962).

Personal meaning not only shapes and triggers activity but also creates a "perceptual set," a state of selective readiness to generate "knowledge of results." Thus, meaning not only drives the activity but it anticipates the sequences of its actions and sets itself to check how well things have turned out. Now, how feedback loops are used as a tool to organise learning can be examined in more detail. Figure 5 illustrates a simplified perceptual feedback and "knowledge of results" activity which underlies the model. In real situations this would consist of multiple TOTE-like activities as well as re-entrant loops described earlier.

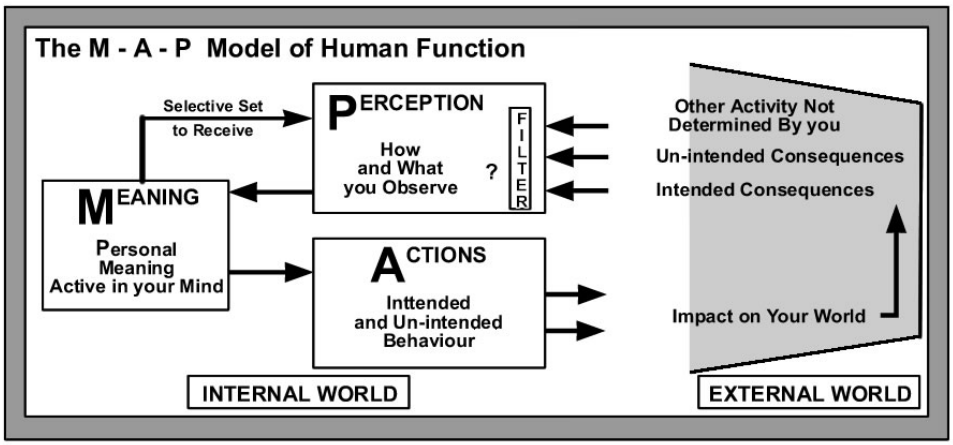
It is important to appreciate the feedback mechanisms involved in SOL. Within cybernetics, error actuated feedback predominates. Control systems and machines are built on this principle, differences between result and expectation is used to take action which reduces the difference. It has already been argued that it is integral to learning to deliberately vary from what was originally intended to bring about change. We can learn from our personal experiments. This introduces the unexpected which has implications for learning. The unexpected is seen as a resource for learning and to explain the unexpected becomes a starting point for new learning. This is fundamental to SOL. Godel's theorem requires that the explanatory system contains at least one more than the model it constructs. We always need to understand where we are to go beyond where we are. This is essentially what is meant by *open feedback* which allows for iteratively modelling one's own process by necessarily conversing with oneself and with the outside world. *It allows us to change our perceptual set* and *generate self-amplifying positive feedback.*

Thus, the construction of personal meaning is seen as a *continuous conversational process which can model experience.* This is where the SOL-er seeks to live. The Learning Conversation offers the learner a tool which can take them to this "magic" place where creative construction of meaning thrives. We can seek the unexpected in our outer and inner conversations and by thriving on it we can change the level of our awareness and the quality of our learning.. SOL-ers bootstrap themselves into a new and more powerful plane of learning. MAR4S and the Learning Conversational method are specifically designed to enhance the quality of this process, thus allowing us to grow our capacity to learn.

The Self-Organised-Learner as a Conversational Scientist

Within Humanistic Psychology, G. Kelly's metaphor of "man as a scientist" suggests that we develop personal theories about everything in our experience (Kelly, 1955). He proposed an inner world of bipolar constructs and developed the repertory grid technique as one way to make this repertoire of a persons constructs explicit. Even here the grid has been used by psychologists in a closed "objects of knowledge" rather than an open transforming mode. Thomas, one of the authors, devised the FOCUS GRID and a suite of programs including PEGASUS, CHANGE GRID, EXCHANGE GRID, and SOCIOGRID as tools for learners to MAR4S their world of constructs (Thomas & Harri-Augstein, 1985, 2001). PEGASUS was the first attempt to embody a conversational meaning elicitation process based on the repertory grid within a computer as part of a research programme in the seventies. CHANGE GRID allows comparison of a person's world of constructs over time and SOCIOGRIDS allows a comparison of similarities and differences between the constructs of members of a group as a basis for conversational reflection and review of shared personal meanings. These CSHL REPERTORY GRID SUITE of programs use a cluster analysis procedure to highlight

Fig 5. The Meaning, Action, Perception Spiral



the pattern of meanings free from statistical generalisations.

On different lines, G Pask designed THOUGHTSTICKER and Thomas and Harri-Augstein designed STRUCTURES OF MEANING. Gordon's Petri-Nets contain the knowledge and THOUGHTSTICKER controls the nature of the learner conversation within a serialist-wholist strategy (Pask, 1973). We have always argued with him that his technology seemed to accept the idea education involves the acquisition of established public knowledge and that therefore he construed the nature of the teacher/learner conversation as one of guiding and controlling the nature of the knowledge that develops in the learner. This does not enable self-organisation which is seen as intrinsic to the deeply personal process of learning. Kurt Lewin, with his formulation of a person's "life space" was ahead of his time in using a topological descriptor to capture personal meaning. Later, he used field theory descriptors for a similar purpose. Hierarchies, tree structures, networks, Minsky's frames, Zadeh's fuzzy sets and computer languages from Visual Basic to Flash Action Script3 formulate structures for representing certain systems of meaning. All these representation techniques from Tolman's "cognitive maps" to Lewin, Kelly, Pask, and beyond are tools to be recruited into a conversational learning technology for enabling "man the scientist" to experiment and construct a personal model, or theory, which becomes the basis for anticipation and action.

Within SOL this inner world of meaning construction is conceived of as the *eight dimensional wheel of personal meaning*, opening up a wider and different definition of how meaning is represented and used in a Learning Conversation.

Units of meaning are interconnected in a complex web so that each of the eight dimensions are complex within themselves and interconnected to each other in a hierarchy of networks. The whole is interconnected beyond the edge of this boundary to the implicit knowing within chaotic processes of inner experience. According to the Gaia principle, this in turn is interconnected and influenced by the interconnectedness of other living entities, the earth, the planet, and the cosmos (Lovelock, 1979). The eight dimensions of personal meaning are themselves in a state of change and growth so that this definition can only be temporary. The organisation of the *units of meaning* within this complex web, cluster into ever higher order networks so that activation into consciousness depends on the context at the time and the purposes which drive a particular activity. As new learning takes place within empirical experience, particular networks will become elaborated and under certain conditions may become transformed. This is the closest we come to the assimilation and accommodation processes of Piaget (Piaget, 1950, 1957). The STRUCTURES OF MEANING technique referred to earlier has been designed to make explicit this process so that it can be MAR4Sed. The higher the network in the system of the networks the greater the generalisation of the meanings so that the lower order clusters and cluster of clusters eventually link to form the persons repertoire of personal myths, beliefs, and values. All eight dimensions will resonate and influence and be influenced by such myths, personal beliefs, and values as the theory building and testing out of the personal scientist or c-indi plays out in the real world.

In modelling their own world of personal meaning the SOL-er is seen as a *personal scientist/artist* engaged in anticipating and testing out through action their "theories" from within their systems of personal meaning, and generating open feedback to validate the whole process. Personal theories are revised in the light of ongoing experience. When

theories are locked in with an inability to appreciate the full consequences of one's actions, these can be viewed as the source of what Rogers calls disruptions to natural growth. In SOL this is seen as the robot in the personal meaning system taking over and this must be taken account of and challenged. As "good" scientists/artists competences from reading to juggling, from mathematical thought to painting, from social skill to yoga, from composing a poem to performing an experiment, from playing a musical instrument to maintenance of a motorcycle, all derive from a capacity to model the construction of personal meanings in ways which are personally significant, relevant, and viable. It is through modelling the eight dimensional wheel of personal meaning that their constructive and creative capabilities can grow. The scientist/artist is seen as operating within a conversational science paradigm (Figure 6). In the conversational methodology of SOL a flexible repertoire of awareness-raising tools are recruited into the Learning Conversation to amplify awareness of each aspect of the process.

Thus, the context within which this process grows and flourishes is conceived of as the *Learning Conversation*. In SOL, the personal scientist/artist becomes the *conversational scientist*. This involves a creative encounter primarily with oneself but also with other human beings or an intelligent machine. The outcome in each case depends on the conversational skill of the SOL-er. The very essence of becoming an SOL-er is the development of an ability to challenge one's robots as well as those of others' and to conduct Learning Conversations with oneself and with others in ways that can cascade through their community. In terms, the conversational scientist becomes the *conversational individual* (c-indi) capable of developing their capacity to learn as students, on the job, and in life. The c-indi may be one, a pair, a group, or a whole organisation. Gordon Pask's P-individual and our c-indi share a common source rooted in a 10-year series of post-graduate seminars jointly chaired by Gordon and Laurie. They differ in the value system played out.

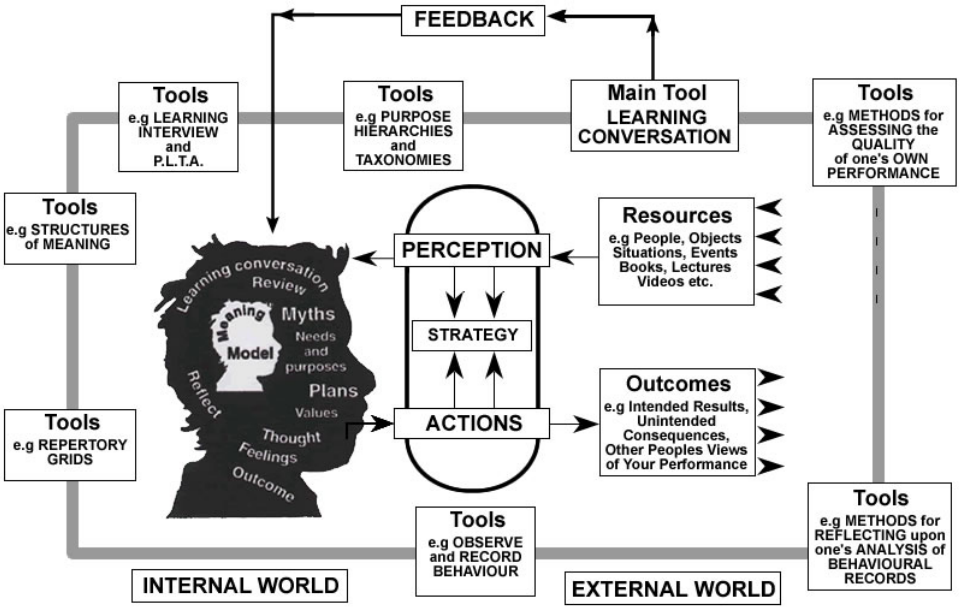
In acting as self-organised learners, c-indi's differ from "other organised learners" who are dependent on the teacher, trainer, or manager. They are locked in their personal myths one of which may be "that teacher/expert knows best." Their own search for meaning is limited to becoming knowledge clones of others and may well be switched off in the process. They fail to continue learning once the teaching process ceases. They fail to adapt creatively to change: they act as robots and have ceased to actively search for personal meaning. They have little awareness of their learning process and lack a language to converse about their learning. They are incapable of addressing life's opportunities as resources for their learning. In contrast, the self-organised learner continually pushes back the boundaries of their capacity to learn. Their learning is challenged and expanded moving holistically through the eight dimensional wheel of personal meaning. This whole bootstrapping process requires the support of the Learning Conversation.

THE RHYTHMIC PATTERN OF THE LEARNING CONVERSATION

In this chapter emphasis has been given to the personal meaning constructing process within SOL.

The structure and organisation of the Learning Conversation; its morphology, and anatomy has been published in a series of conference papers, reports, invited chapters, and several

Fig. 6 The Sol-er Acting as a Personal Conversational Scientist



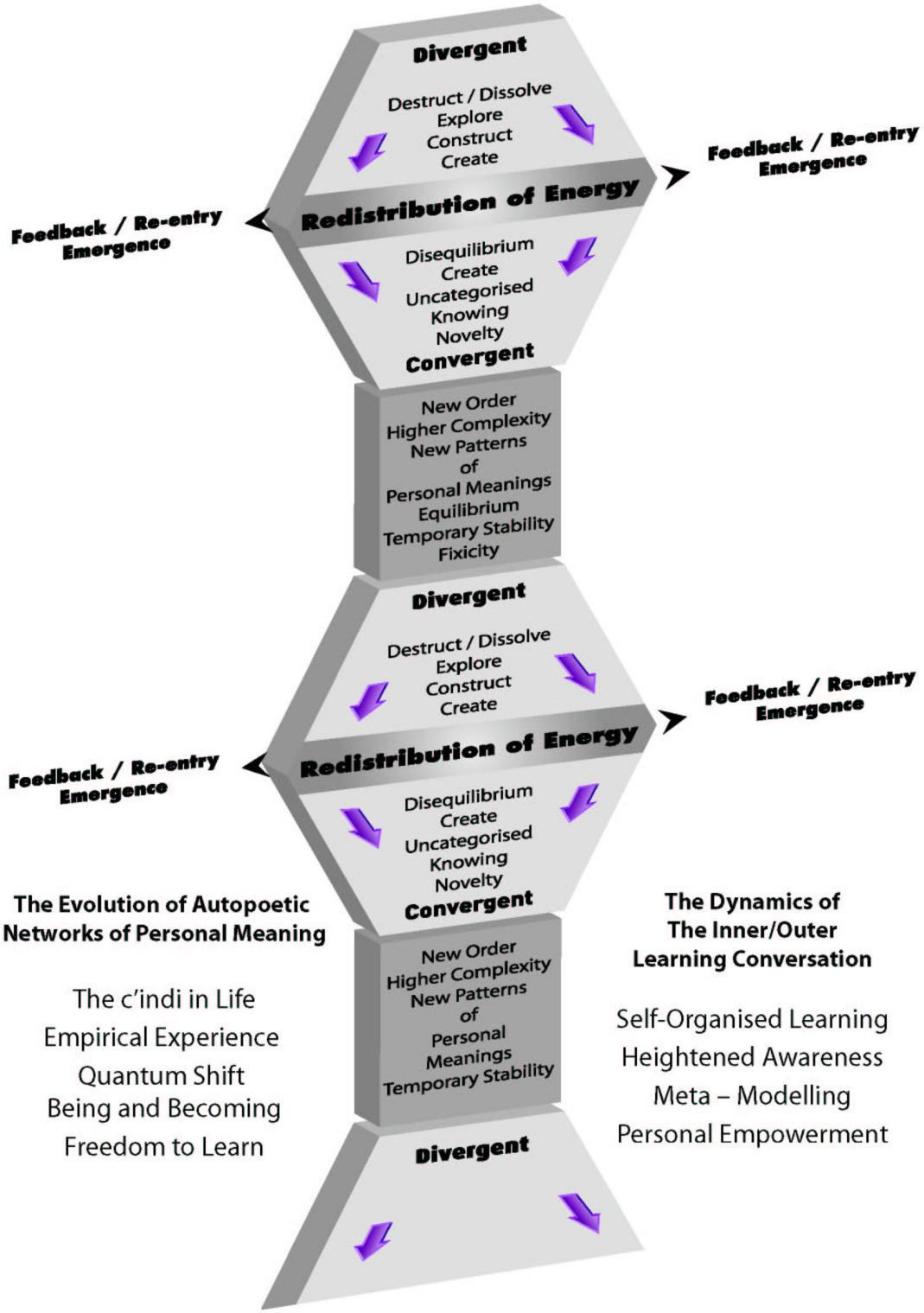
books. Numerous examples are given from our action research projects of how individual learners, teams of learners, and a whole organisation transform their learning potential as they engage in their SOL experiments. Some of these are referred to in the references. However, the rhythmic pattern of activity characteristic of the Learning Conversation, over time needs to be further emphasised. Figure 7 offers a holistic topological overview, which shows the dynamic rhythmic pattern which characterises the Learning Conversation through short, medium, and longer term time-spans. *The Learning Conversation can itself be seen as a dissipative structure allowing the flow of processes to take place within it.*

The Learning Conversation advances in phases of alternating *divergent* and *convergent* activities. The divergent phase allows new processes and patterns to emerge within an open exploratory support environment. Learners go beyond their current boundaries and can shift from "task-bound" awareness of their learning to a "learning focussed" awareness. Personal myths about their learning may be dissolved and new ways in their approach to learning explored. As these become consolidated and experimented upon, convergent activities lead to the formulation of a series of personally constructed commitments in the form of *Personal Learning Contracts* (Harri-Augstein and Thomas, 1991). The learner is committed to discover what may happen as new pathways are ventured and are invited to justify the success of their experiments in the real world, in their own terms. A temporary period of stability allows the emergence of new personal theories about their learning, which may become part of their changing beliefs and values about themselves as learners. Such alternating phases are characterised by the ebb and flow of energy and periods of anxiety, aggression, tension, and anger, as well as exhilaration, excitement, and joy mark the emotional states of the learner as energy is redistributed and new explanations emerge.

The rhythmic pattern which characterises the Learning Conversation resonates with the multiplicity of rhythms integral to the "Music of Life" and the whole Cosmos (Noble, 2006). In nature the balance of equilibrium and dis-equilibrium of physiological processes, the rhythm of respiration, the diastolic and systolic beat of the heart, patterns of sleep and wakefulness expressed in circadian rhythms, determining 24 hour cycles of biological activity, behavioural changes in animal and plant species according to the seasons, swings of depression and creativity in bipolar disorder, the DNA,/RNA,/Protein pattern of activities in living cells, and many more, from the seasonal rites in religious and totemic ceremonies, to the music of the spheres and the rotation of planets around the sun, at the mega level and to the behaviours of the sub-atomic particles at the micro level, all embody vibrant conversational rhythms in space and time. Barrow (1999) has hypothesised that "conversation" is a fundamental constant of nature and the Cosmos. Davies (2006) has recently presented a radical view of the whole of the universe as a self sufficient, self organised entity, and in dynamic conversation with itself. It would be hypothesised that the Learning Conversation is attuned to the music of life, to the conversational systems in nature, and to emergent biology, ecology and the Tao: it is a fundamental constant of fully-functioning human beings. Learning entities made up of one or more *conversational individuals* (*c-indis*), are creative, self-organised-learners empowered to enhance their capacity to learn and to shape new trajectories for human destiny. In the spirit of Varela, this may apply to the whole of life.

The Learning Conversation with its dynamic, rhythmic pattern, has the power to reflect on

Fig 7. The Rhythm of The Learning Conversation:
Self-Organised Knowing within Conversational Space



The Evolution of Autopoetic Networks of Personal Meaning

The c'indi in Life
Empirical Experience
Quantum Shift
Being and Becoming
Freedom to Learn

The Dynamics of The Inner/Outer Learning Conversation

Self-Organised Learning
Heightened Awareness
Meta – Modelling
Personal Empowerment

itself. This enables the internalisation of the conversational process generating a language which enriches the personal meaning system and which integrates into the psyche of the person. Analogous to the autopoiesis capacity of life, with its unique ability to reproduce itself, the Learning Conversation becomes mirrored in all human activity. Thus, Self-Organised-Learning becomes *a way of life*. Those individuals and communities that can interpret life-long-learning in these terms, remain so far, the maverick few. It requires a revolution in policy for SOL to emerge as an acceptable model for the Education System and to be supported by it. Policy change will involve a new approach to leadership, from that of the formal designer and executor of pre-planned curricula and algorithmic, top down processes, to that of facilitator of emerging new structures and behaviours unique to each individual learner. As participative conversational leaders of teams of SOL coaches and SOL-enlightened managers, tutors, subject matter experts, and intelligent learning software designers, the future survival of education would be more assured.

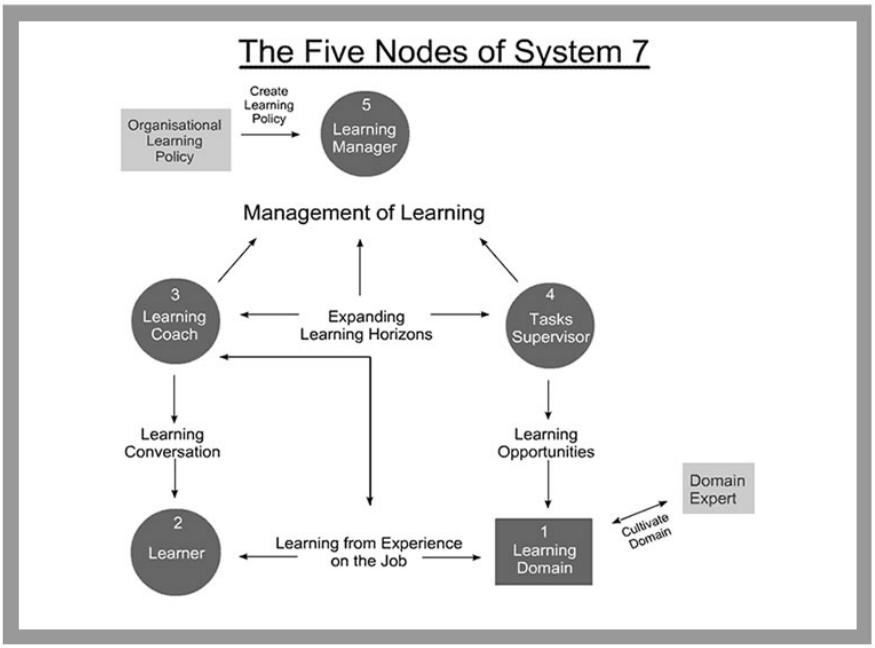
SOL SYSTEM-SEVEN FOR EDUCATION, LEARNING ORGANISATIONS, AND LEARNING COMMUNITIES

In our action research projects a system of Learning Conversations has been pioneered in schools and universities as well as in commercial and government organisations. The outcomes have been exciting and promising despite many obstacles to growth and development (Thomas & Harri-Augstein, 1995).

In SOL System Seven, the SOL coach conducts a series of Learning Conversations over time with individual learners and groups enabling them to take over this function for themselves. It may seem that the role of SOL coach becomes obsolescent but as the system as a whole develops, new demands are made and the SOL coach is constantly learning to progress his or her role. As this process develops in an organisation, new demands emerge and System Seven for SOL opens up *seven types of Learning Conversations* requiring additional reflective learning tools and different kinds of support in the organisation as a whole. SOL System Seven functions as an interconnecting network of Learning Conversations involving multiple feedback loops at different levels of organisation. Learners converse with their SOL coaches; they in turn converse with task supervisors, tutors, and human or intelligent machine learning resource providers. SOL coaches also converse with SOL managers and they in turn with organisation executors. A community or organisation which has learnt to function in this way develops its own learning intelligence and its own learning capacity as a dynamic "learning entity" or c-indi. In our book *Learning Conversations for Individual, Team and Organisational Growth*, this SOL System Seven is described in detail. This illustrates how the results of such Learning Conversations give rise to further self-generating, amplifying feedback loops which exhibit temporary states of closure when a shared system of personal meanings, explanations, beliefs, and values and a new mythology emerges which in turn will need to be challenged when conditions of change demands.

It is time to shed outmoded concepts of learning upon which much of education is based. These belong to a Newtonian, pre-quantum world. The dangerous, chaotic, fast changing world we have helped to shape, where climate change, pollution of the planet, new viral diseases, overpopulation, poverty, and terrorism challenge our political, business, and religious leaders, and where battles for power between super-nations predominate, the need

Fig 8. S O L SYSTEM SEVEN:
as a Framework for EDUCATION and Learning Organisations



for creative SOL-ers is greater than ever. Through communities made up of c-indis we just might be able to transcend the problems facing us to contribute towards a more harmonious self-organising and viable world.

Implications: Education, Training, and SOL

A critical commentary on the educational system has been laced throughout this chapter. The concept of a teacher, trainer, or expert representing their meaning and the learners constructing personal meaning in the presence of such representations of meaning, be they in the form of a lecture, printed matter, videos, the Internet, and the whiteboard has potentially the characteristics of a conversational learning process. The SOL mthodology offers a way in which this process can be made more explicit and through heightened awareness and support learners can achieve wat Rogers called "freedom to learn" (Rogers, 1969). Dewey, Bruner, Kelly, Rogers, Maslow, Illich, Jung, Einstein, Feynman, Ouspensky, and Lao Zu are amongst those progressive thinkers that would appreciate this, and each has produced descriptions of creative learning that acknowledge an individual's rights to self-regulate their own learning processes. In SOL the person is a sovereign learner. Yet, the policies and mechanisms whereby this can be achieved by all have, by and large, remained in embryonic form. The system of education is not supportive to SOL The consequence has been that attempts to practice this in some of the schools and in higher education has at best only partially succeeded in the long term. Too many obstacles impede its growth.

SOL has been successfully introduced into a primary school, a further education college, the teacher training curriculum in two institutes of higher education, into university departments, a business school, and a students union Learning-to-Learn programme. Evidence in each case showed a *shift from a teaching to a learning culture* as SOL-ers made novel demands on their teachers, lecturers, tutors, and on the ways they were being examined, which were only met when these professionals agreed to involve themselves in the SOL experiment. SOL has been effectively addressed within an Intelligent Learning System (ILS) for effective performance in highly skilled and complex tasks in the MOD. A SOL System Seven has been successfully installed in two large Post Office Sorting Offices of the Royal Mail with outstanding outcomes in terms of changing attitudes and learning skills at various levels in the chain of command as well as in company efficiency and quality of service based on company objective measures. In each Head Office teams of SOL coaches and SOL managers appointed from the organisation's own operational staff developed their skills "on the job" alongside the action researchers. A system of Sol coaches has been created nationally in the Post Office, through a series of workshops and "on the job" support, as part of their operational management with significant success in "team learning" and in organisational "objective measures."

Other projects have been with the Metropolitan Police, HM prisons, and various commercial organisations. Paradoxically, it is in the commercial and business sector that SOL has been most enduring in its effect. However, in most cases the policy of the organisation has not been attuned to SOL and unenlightened senior staff have failed to support SOL as this began to flourish. Fixed institutional structures and processes have suffocated its growth. Whilst individuals and teams have transformed their learning, they have faced insurmountable obstacles to growth and only isolated pockets of SOL activity have successfully endured once

the action research team withdrew their support..

By and large, "learning" is conceived of by education and training practitioners as:

The acquisition of appropriate knowledge, skills, and attitudes to be measured by publicly acknowledged standards

or

The achievement of valued changes in behaviour or experience, to be assessed according to some predetermined norm.

But, who is to decide what is appropriate? And who is to value the changes?

In this chapter, the authors have argued that personally valued changes and the learner's own evaluation should have priority. A definition of Self-Organised-Learning was presented in the Introduction and is repeated here to show the difference in approach.

Definition of Self-Organised-Learning:

… the conversational construction, reconstruction, and exchange of personally significant, relevant, and viable meanings with purposiveness and controlled awareness. Patterns of meaning become the basis of anticipations and actions in the world and the quality of these encounters depends on skill in generating appropriate feedback. By modelling this process learning evolves.

Talent and creativity must not be seen as a gift of the few, rather these can be constructed. We might not aspire to become a Feynman, nor should we, but in the ways he pursued knowledge without prejudice, he is an example of what learning can achieve. Having redefined quantum mechanics, on sabbatical he learnt enough biology to make an important contribution to understanding mutations in DNA, his musings for fun on the possibility of tiny machinery led him to became the father of nano-technology, he taught himself to play drums, tell stories, keep track of time in his head, how to pick Yale locks, and how to write Chinese, amongst many other skills! He was a natural scientist as a child. It had already occurred to psychologists that children are innate scientists, experimenting with the possible and impossible in their confused universe. Every child is an observer, analyst, and theory builder; the unfamiliar and the strange are the domain of children and scientists.

The young demonstrate through play and their epiphanies, a natural capacity for Self-Organised-Learning but as they progress through school and higher up the educational ladder, few maintain and grow this capability. It is mysteriously lost from within their own psyche and there exists a *learning entropy* in the "mindpool" of our culture.. The notion that learning is not a repetitive process but that each learning event can be seen as a new opportunity for developing learning competence, so that each event builds on the last in an ever increasing capacity for learning, is non-existent. Learning a new language offers a bootstrapping experience for learning another more quickly and effectively, and so with any other learning event. We are at the stone-age in our learning culture, yet the demands on our capacity to learn have never been greater.

Psychology, despite the innovative contributions by progressive experts, has failed to offer a comprehensive model to meet the needs of learners and their teachers. The behaviourist domination from the North American tradition produced programmes which were totally "other -organised." The "discovery" and "guided discovery" programmes of the 70's and 80's largely failed because these lacked precise and explicit learner-centred methodologies. The exponential growth of educational information technologies has offered education programmes for the student masses. But this may turn out to be a poisonous chalice. It may result in apparently educated professionals whose other-organised student experiences disable them as adult learners. The EU Delta Evaluation Study of 38 computer-aided learning projects across the whole of Europe, in which we took part, revealed a "pedagogic learning deficit" in all these projects.

In the fast-changing world where new demands emerge every nano-second, and the rules of today become the chains of tomorrow's mind, the danger of remaining in a traditional, instructional mode is obvious. We need teams of creative learners in all endeavours of our cultures, from scientists engineers and technologists, architects, artists, teachers, and coaches to shape an alternative constructive future. It is argued that a self-organised learning approach supported by the Learning Conversation methodology and technology provides a way forward for those who profess to belong to a new paradigm of human learning. Our action research programme conducted over 3 decades in commercial as well as education institutions enabled the development of the theory of SOL and the practice of Learning Conversations. This programme offers ample evidence to demonstrate that the future for "human learning" is only just beginning. However, this depends on radical changes in educational policy from a framework giving emphasis to "other-organised-learning" towards a more "Self-Organised-Learning" conversational approach.

A new species of learning is on the horizon; *creative learning,* which has been named Self-Organised-Learning. Many have and can continue to contribute to its flowering, given financial and practical support. So far, it is a fragile mutant which as with liquid nitrogen when exposed to air, it can evaporate without trace. An International College for SOL has been inaugurated (Taylor, 2003) and it is hoped that our "conversational colleagues," including those contributing to this challenging book, be offered opportunities to grow their conversational frameworks for learning in their own unique ways.

To end, the axioms for a conversational science of human learning born out of over 30 years of action research at the Centre for The Study of Human Learning (CSHL) are summarised.

THE AXIOMS FOR A CONVERSATIONAL SCIENCE FOR ENABLING SELF-ORGANISED LEARNING

1. That the elements of inquiry are conversational entities engaged in conversational endeavours.
2. Conversation is a process in which meaning is negotiated. Thoughts, feelings, and perceptions about the negotiation of meaning can not be described within the explanatory system of traditional physical science. An extended post quantum science is needed to explain the web of connectedness in all of life.
3. The method of conversational science expresses the knowing of it and the knowing is

informed by the method: method and knowledge co-exist in a dynamic symbiotic relationship.

4. Conversational science offers fresh insights into other forms of scientific inquiry. This is because its knowledge and the method can enable other paradigms to renegotiate their explanations with themselves and with one another.
5 . Conversational science is an open system within which learning is a dynamic process between sentient entities and their environment. Perturations from the environment trigger changes but as with all living systems, such entities have a capacity to specify their own directionality and change and can actively select which perturations trigger them.
6. Learning entities maintain themselves in a state far from equilibrium and operate on the "edge" of chaos. The conversational dynamic acts as a dissipative structure and allows for the spontaneous emergence of new and more complex forms of order.
7. Conversational science allows human beings the means to self-organise their own change through awareness of their own processes: This is generated by self-amplifying feedback loops and re-entrant feedback between systems: Self-organised change is the most meaningful definition of freedom and a healthy world.

Further Research and Development Applications of Self-Organised Learning

Emerging out of the success of 30 years of action research for the development of SOL in education, government and commercial organisations, seven areas for further research are identified. Given the fast-changing and unpredictable world of today there is now an urgent need to expand this research on a wide front, so that SOL can be supported, sustained, and better integrated within education, our cultures, and society as a whole.

1. To further explore how the SOL conversational model can form the basis for executive and organisational coaching so that the vision and needs of an organisation can be better met. In giving emphasis to the advancement of learning potential SOL transforms the learning of tasks, skills, and knowledge "on the job." SOL Systems Seven offers a model within which teams of "learning managers" and "learning coaches" can function together for the advancement of the individual, team, and organisational growth.
2. To enable the shift from a teaching to a learning culture the reflective conversational tools of SOL can monitor and support this process. Better emphasis can be given to the quality of personal learning and tutors can be enabled to conduct one to one and group Learning Conversations, both face to face and on line.
3. To transform the nature and support system for life-long-learning, "on the job," on courses and in life. Each and every experience can be seen as an opportunity for learning so that an individual's capacity to learn is continually developed. Each person from cradle to grave can be empowered to become a SOL-er.
4. To empower innovation and creativity through the practice of MAR4S as a reflective and feedback process, so that organisations can benefit from its participants latent creative abilities. MAR4S enables self-generated feedback and opens up possibilities for creative thought and experimentation.
5. To further develop an e-based technology of "personal learning shells" to facilitate the learning of complex tasks and subject matter by means of the SOL functional

taxonomy of conversational tools. Computer based behavioural records can be used for self "talkback" and personal meaning elicitation software technology can record the progress of personal understanding. Used together, the emergence of an enhanced awareness of learning processes takes place which can enrich the personal language of learning. The Personal Learning Contract (PLC) can become an e-based tool for computer based Learning Conversations.

6. To develop methods for introducing SOL into the teacher training and management development curriculum, so that future teachers, trainers, and managers are equipped to support and sustain SOL within their organisations.
7. To further develop a multi-perspective conversational evaluation technology for monitoring the quality of learning, both process and outcome. The SOL spreadsheet, Personal Learning Contract and Personal Learning Biography (PLB), offer tools for recording individual progress. The SOL Feedback for Learning package provides a multi-perspective vehicle for monitoring and supporting individual and team personal development plans.

By enabling a radical, constructivist, and fresh approach to human learning, SOL offers a system capable of transforming our capacity to learn to hitherto unexplored new levels, extending the horizon of human experience.

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