

ORGANISATIONAL LEARNING

- foundational roots for design for complexity

Angela Nobre

Escola Superior de Ciências Empresariais, Instituto Politécnico de Setúbal, Campus do IPS, Estefanilha, 2914-503 Setúbal, Portugal

Keywords: Organisational learning, organisational design, complexity, sociotechnical systems, systems theory, social systems, and appreciative inquiry.

Abstract: This paper presents an overview of the field of organisational learning and claims that its foundational roots still have to be further developed and explored. This critique points to the potential of sociothechnical systems, complex systems theory and appreciative inquiry as building blocks from which an effective organisational learning design can emerge. The current challenges faced by organisations are related to the complexity of the knowledge economy. These challenges need to be answered by an organisational development strategy that incorporates competitive issues, corporate governance and sustainability concerns.

1 INTRODUCTION

We have entered a new era in the evolution of organisational life. There are immense forces of change present simultaneously: technology development, societal change, global markets and an increased complexity and volatility of organisational environments. New terminology captures the changes in work-life reality: post-industrial society, the information revolution, the post-capital society, and the knowledge age. Kearmally (1999) refers to the knowledge economy of the information era. The information era and the knowledge economy imply the need for a learning society.

At organisational level the issue of learning may be interpreted as the overall adaptation and development which is necessary in order to profit from the challenges and opportunities of the new environment. Though we might not be able to fully comprehend and grasp the magnitude of the changes, organisations and managers are struggling to find the balance between economic performance, managing business transformation, and business and human sustainability.

Organisational learning has developed from many roots and threads of thought. As the field matures it is critical that some of the baseline concepts are not overlooked. In tune with hierarchical systems theory, it is necessary to

distinguish those issues which have a structuring effect over the others thus allowing for an overall consistent development. Hierarchies exist because not everything has the same importance, which does not imply that we need hierarchical organisations as we know them. Prescriptive, simplistic and mechanistic forms of interpreting and promoting organisational learning are of less consequence than exploratory, complex and interpretative approaches. In order to envision what paths will lead us in what directions it is important to consider the criteria of what might bring us to a situation where the greatest diversity of possibilities may materialise, i.e. how may we open and keep open the complex systems in which we are immersed.

The current paper focus on some of the origins of organisational learning and aims at pointing at an approach which may help twenty first century organisations to deal with the daily struggle of bridging theory and practice, our intentions and our actions, and what the organisation as a whole officially states that it stands for and how that materialises into current reality.

Figure 1 presents a general overview of the key concepts and theories developed in the paper.

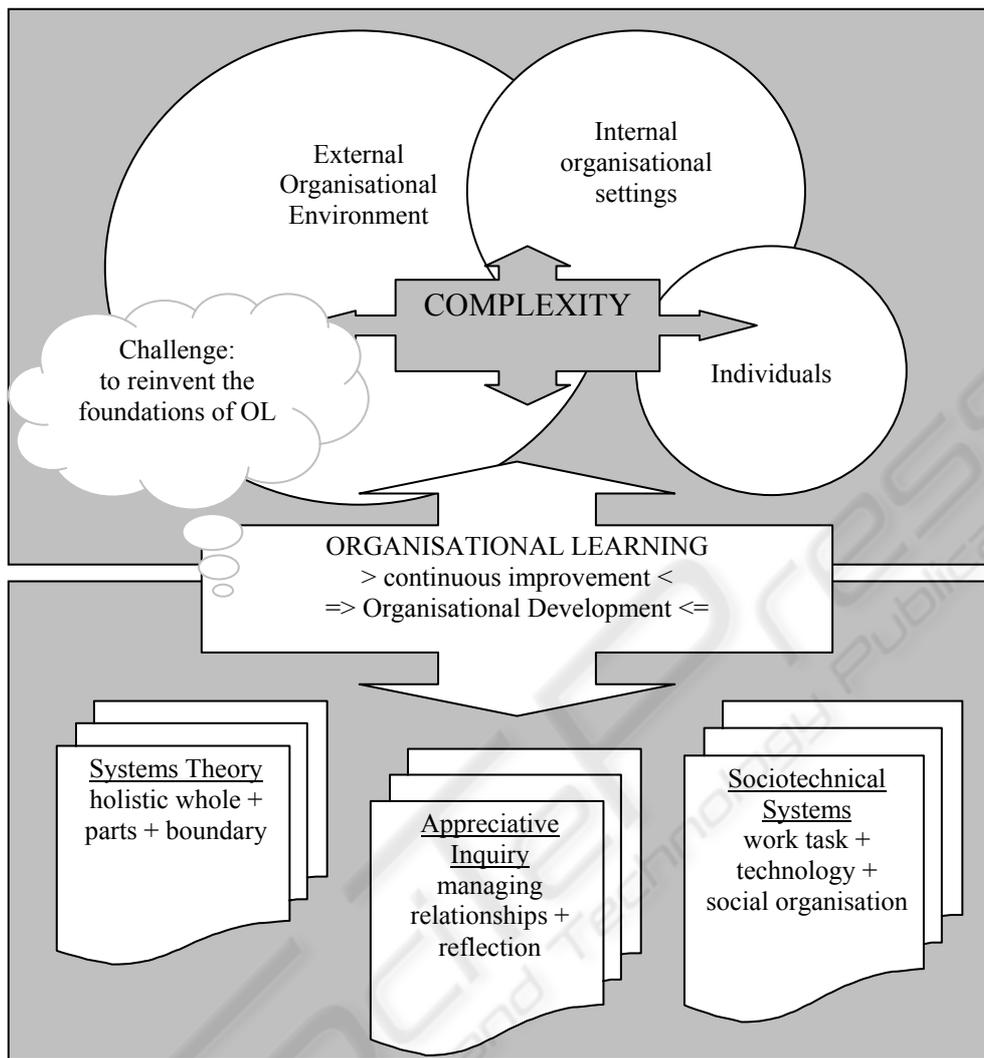


Figure 1 – The need to reinvent the foundations of Organisational Learning

2 ORGANISATIONAL LEARNING DEVELOPMENT

There has been a continual effort to devise managerial innovations able to deal with the challenges posed by the organisations' environment changes. Examples of these efforts are: empowerment, business process reengineering, self-managed teams, sociotechnical systems redesign, and total quality management.

Some authors comment that often, the application of these methods has been linked to a fashion or a management fad motivation (Abrahamson, 1996, 1999; Gibson and Tesone, 2001). There is a growing recognition that these methods too often failed to deliver their promises (Beer, 2000). Lillrank et al (2001) claim that the

impacts of the continuous improvement methods, tools, and processes that aim to help organisations to enhance their productivity, quality, and worker's quality of working life are usually short lived. Pursuer and Cabana (1998) state that the problems with the reduced effectiveness of these methodologies, when applied in real life situations, is due to their link, in practice, with the concepts of traditional hierarchical organisations and industrial age notions of management.

In response to the complexity and uncertainty of a turbulent environment, the learning organisation appears as an effort to radically develop a continuous innovative and adaptive capacity.

Organisational learning developed from the methodologies already mentioned and also from the early pioneering experiments with self-managing and learning work-systems conducted in early action

research projects such as the sociotechnical work in British and coal mines and Scandinavia (Shani and Docherty, 2003; Obholzer and Roberts, 1994). Marquardt and Reynolds (1996) published a comprehensive list of companies which have engaged in some activities around creating a learning organisation.

The conceptualisation of organisational learning is complex and its origins cannot be pin-pointed in a precise way, in part because this is a new management discipline and consequently its conceptual basis are still being developed in a continuous way. Yet there is a set of contemporary theories which help us to distinguish early influences, such as: business strategy theory, resource-based view of the firm, behavioural theory of the firm, systems theory, sociotechnical systems theory, group behaviour, action research and appreciative inquiry, human development, individual learning theories, organisational change theory and organisational development theory.

To make the picture even more complex, each of these influences brings with it a range of different approaches to the same knowledge area. For instance, the literature on individual learning within organisations runs through different streams of educational, psychological, and organisational behaviour research (Cowan, 1995). Organisational learning itself has been studied from different perspectives including: organisational sciences, sociological, economics, organisational change, and development research (Antal, Lenhardt and Rosenbrock, 2001). Garvin (2000) claims that despite the popularity of the organisational learning approach, the field lacks a shared definition and coherent framework for action, and thus it is of limited relevance to the practical-minded manager. There is a clear need to work on the seminal work of the founders and to integrate theory and practice.

3 ORGANISATIONAL LEARNING AND ORGANISATIONAL THEORY

Rami Shani and Peter Docherty (2003) call attention to the increased popularity of organisational learning and state that it has shifted to the centre stage of organisational theory. Authors such as C. Prange (1999) and the works of Shani and Stjernberg (1995) suggest and illustrate this move.

An increasing number of organisational theorists and executives are predisposed to understand and adopt the learning organisation concept. Some view organisational learning as a comprehensive approach

that provides a window of opportunity for assimilating advanced managerial approaches.

However, not all efforts materialise into positive results. A follow-up study of US organisations (Moingeon and Edmondson, 1996) that attempted to assimilate new managerial approaches revealed some failures among those that did not have the foresight to construct a suitable mechanism for organisational learning that incorporated processes, tools, and work patterns. Shani and Docherty (2003) refer also that the published literature does not provide sufficient knowledge regarding implementation and they state the examples of Popper and Lipshitz (1998), Raelin (2000), Stebbins and Shani (2002) and of Ulirich, Jick and Von Glinow (1993).

Planning makes learning more conscious, better focuses effort, and increases measures of accountability, as long as learning does not become an end in itself with only loose coupling to the work processes. Planning allows people to nurture learning strategically and to take advantage of a wider range of learning strategies that might otherwise be overlooked. Marsick and Watkins (1997) indicate several difficulties that may hinder informal learning, namely:

- organisations do not always let people follow their natural inclinations to learn in different ways
- people differ in their capacity to seek needed information and skills
- there is a disagreement as to what learning to learn means and therefore as to how to help people to better learn how to learn
- the topic of learning might require the assistance of outside experts
- and organisations may not provide clear guidance regarding what people must know and how this will assist them in their career paths

Since learning demands constant and ongoing questioning and inquiry into current and future practices, it can be viewed as a continuous disturbance of existing routines that were developed for the purpose of stability, predictability and efficiency.

Faced with the decision to focus on learning, many managers continue to view the energy, time and effort spent on learning as wasteful and unproductive (Garvin, 2000; Schein, 2002).

The situation is further complicated for managers by the disturbing paradoxes relating to learning, such as the relations between learning, knowledge and action. The development situation requires reflection, experimentation, new alternatives, and tolerance to risk and uncertainty. Learning requires balancing routine and reflection. The inherent

challenge fosters the need for managers and practitioners to have access to, and develop basic understanding of, the ideas and theory behind the learning organisation mechanisms, including understanding of their origins and development.

As has already been mentioned, despite the energy, time, and money that companies spend on attempts to transform organisations through a variety of change programmes, the reality is that few succeed in sustaining the reinventing process (Beer, 2001).

4 ORGANISATIONAL LEARNING ACCORDING TO SOME KEY AUTHORS

It is interesting to observe the different ways in which organisational learning has been described by leading authors of the field. Shani and Docherty (2003) collected the following citations as descriptions of organisational learning or of learning organisations:

- «... is a process in which members of an organisation detect error or anomaly and correct it by restructuring the organisational theory of action, embedding the results of their inquiry in organisational maps and images.» (Argyris and Schön, 1978)
- «...includes both the processes by which organisations adjust themselves defensively to reality and the processes by which knowledge is used offensively to improve the fits between organisations and environments.» (Hedberg, 1981)
- «... organisations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspirations are set free, and where people are continually learning how to learn together.» (Senge, 1990)
- «...the intentional use of learning processes at the individual, group and system level to continuously transform the organisation in a direction that is increasingly satisfying to its stakeholders.» (Dixon, 1999)
- «... is an organisation that is skilled at creating, acquiring, interpreting, transferring, and retaining knowledge.» (Garvin, 2000)
- «... is a process of inquiry (often in response to errors or anomalies) through which members of an organisation develop shared values and knowledge based on past experiences of

themselves and others.» (Friedman, Lipshitz, and Overmeer, 2001)

5 THE DESIGN OF LEARNING MECHANISMS AND ORGANISATIONAL COMPETITIVENESS

Organisational learning needs further theoretical development able to direct and inform organisational practices and action. Organisational development itself is the key answer to competitiveness improvement within the challenging context of the knowledge economy.

«The literature on learning in the context of work, at the individual, team, and organisational levels, is vast. Yet, despite the fact that many organisations and researchers jumped on the organisational learning bandwagon, the field lacks a coherent framework and practical models for action.» (Shani and Docherty, 2003).

These authors claim that the relation between individual and collective learning is a 'chicken and egg' question, and that knowledge is created in the ongoing joint work commitments and dialogues in, for example, teams.

These authors take a design perspective on learning and sustainability and state that organisations make choices about the design and implementation of specific learning mechanisms that fit their goals, culture and business context. They view 'learning mechanisms' as: formalised strategies, policies, structures, processes, management systems, ICT systems, methods, tools, routines, and the design of physical or virtual workspaces that are created for the purpose of promoting and facilitating ongoing learning in the organisation. They continue to clarify that learning mechanisms may concern formal and informal learning at an individual, team, and organisational level.

Shani and Docherty (2003) also state that they view the learning mechanism for organisational learning as a formal configuration – structures, processes, procedures, rules, tools, methods and physical configurations – created within the firm for the purpose of developing, enhancing, and sustaining performance and learning. Just as there are many types of organisational designs, there are also various ways to design and manage organisational learning mechanisms. The design of a specific configuration is viewed as a rational choice among alternatives based on learning design requirements and learning design dimensions.

Achieving and maintaining competitiveness is a powerful incentive to improve organisational learning processes, as long as there is a visible link between the two efforts. Many organisations miss to see and to work on this link.

Shani and Docherty (2003) claim that «mastering the art of learning is not a ‘quick fix’». Their contention is that one of the main reasons for the failure is that most companies do not manage to develop and nurture learning mechanisms that allow them to challenge the basic assumptions about the key/core business processes and as a result are not able to alter their mental models and actions. They call attention to new and increasing learning needs and give the example of manufacturing companies that reported in 2001 that they had 80 percent of the personnel they will have in 2010 but only 20 percent of the technology, implying that there will be a strong pressure to constantly adapt to the new technology. They also stress the fact that the opportunity to learn is not received by many workers as an offer of a generous fringe benefit, but rather as the threat of a ‘last straw that breaks the worker’s back’, meaning that those who will not be able/willing to learn would have to leave the company.

The rationale for learning by Shani and Docherty (2003) is that sustained competitiveness at the company level requires competence or capabilities ‘on the cutting edge’, which, in turn, requires continuous learning. They call attention to the recent developments in business and working life that have been characterised by the shift from the industrial to the finance economy, by rapid advances in ICT with new technology generations every few years, marked deregulation, and the introduction of management models and methods to ‘heighten efficiency and effectiveness’, such as lean production, time-based management, business process reengineering, outsourcing, downsizing, and contingent labour. For companies the goals have been rationalisation and increased flexibility. For personnel the consequences have often been increased work intensity, worse working

environments, and decreased personal security in terms of employment as has been stressed in the work of Wickham (2000). The organisational learning approach may bring together loose ends within a company’s strategy, through the alignment of the potentially conflicting interests of key stakeholders.

A critical issue is that it is relatively easy to develop a neat theoretical approach to organisational learning. What is indeed difficult is to live through that theory in daily organisational life as the complexity cannot be hidden away as if it were external to our straightforward model. Thus the need to dive deep into the waters of other origins of the field in order to bring some *depth and breath* to the organisational learning field. These are the aims of the next sections.

6 ORGANISATIONAL LEARNING AND SOCIOTECHNICAL SYSTEMS

Many of the key issues as well of methodologies developed within the conceptual framework of sociotechnical systems, forty years ago, are still valid to current organisational learning approaches. However, the links are not always visible or accounted for.

The origins of sociotechnical systems date from the period after the second World War. The work of two social scientists, Fred Emery and Eric Trist, pioneered the movement toward experimentation with alternative work redesigns, different forms of employee involvement, varied degrees of autonomy and responsibility in work teams, participative management orientations, and the development of learning systems, all with deep concerns regarding economic performance (Emery and Trist, 1969, cited in Shani and Docherty, 2003).

Based at the Tavistok Institute in London, in the early 1950s they introduced a method known as sociotechnical systems design to British industry. Their work is a landmark in the field of organisational design, change, and development, as it is represented the first attempt to introduce flexible learning forms of organisation into the world of work.

Eric Trist’s study focused the work organisation of the coal-mining British industry which had been nationalised straight after the war (Obholzer and Roberts, 1994). Through this study it was discovered that groups of workers supposedly doing similar jobs in separate coal mines in fact organised themselves very differently, and that this had significant effects

on levels of productivity. This led to the concept of the self-regulating work group, and to the idea that differences in group organisation reflect unconscious motives, which also affect the subjective experience of the work. It was through this project that the 'socio-technical systems' came to be defined as an appropriate field of study (Thrist et al, 1963, cited in Obholzer and Roberts, 1994).

Organisations as sociotechnical systems can be understood as the product of the interaction between a work task, its appropriate techniques and technology, and the social organisation of the workers pursuing it. While originating from research in industry, this approach has subsequently been applied to the study of a wide range of organisations. In particular, Isabel Menzies' study, «Social systems as a defence against anxiety» (1960, cited in Obholzer and Roberts, 1994), to identify the causes of high drop-out rate from nurse training was an early example of bringing the Tavistock Institute of Human Relations (TIHR) sociotechnical model to bear on an institution where the technical system is largely human.

7 ORGANISATIONAL LEARNING AND SYSTEMS THEORY

Systems theory is an area which has had a profound foundational influence in organisational learning even if not always visible, recognisable or recognised.

Systems theory was also another avenue for research at the Tavistock Institute of Human Relations (TIHR) in the post-war era (Obholzer and Roberts, 1994), as it was one of the imports from the social sciences that underpinned socio-psychological thinking. The particular application of open systems theory to the work of TIHR was substantially the contribution of A. K. Rice, later working with Eric Miller.

In essence, the open systems view sees an institution as having boundaries across which inputs are drawn in, processed in accordance with a primary task, and then passed out as outputs. While this may sound like a model best suited to understanding manufacturing processes, Miller and Rice (1967, cited in Obholzer and Roberts, 1994) applied it far more widely. They traced many of the difficulties faced by work groups to their problems in defining their primary task and in managing their boundaries.

TIHR researchers did not go in as experts who already knew what their clients must do to improve things: they went to study whatever they would find. The study was undertaken jointly with the clients,

and, to a large extent, by them. TIHR staff then sought to contribute a way of construing their observations and experiences, which they believed would point to potentially helpful changes. Once introduced, the effects of the changes would themselves become the subject of further study, leading to further change. The role of the TIHR staff member was designated as 'participant observer', and the whole style of working was known as 'action research'.

Within systems theory the notion of autopoiesis has a critical role. Autopoiesis is a term from biology which was adapted and adopted by Maturana and Varela to describe the 'organisation of the living' (Maturana and Varela, 1980, cited in Winograd and Flores, 1986). Maturana was a neurophysiologist who greatly developed the biological aspects of cognition. He searched for explanations of the origins of all phenomena of cognition in terms of the species history, the phylogeny, and in terms of the individual history, the ontogeny, of living systems. According to Maturana, an autopoietic system holds constant its organisation and defines its boundaries through the continuous production of its components.

Winograd and Flores (1986) while aiming at studying the design of computer technology, use Maturana's theories as well as those from different philosophers in order to develop an 'understanding of computers and cognition'. They explain their rationale this way:

«All new technologies develop within a background of a tacit understanding of human nature and human work. The use of technology in turn leads to fundamental changes in what we do, and ultimately in what it is to be human. We encounter the deep questions of design when we recognise that in designing tools we are designing ways of being. By confronting these questions directly, we can develop a new background for understanding computer technology – one that can lead to important advances in the design and use of computer systems.» (1986)

As the work of these authors is, on one way, philosophical and, on another way, directed to the study of computing technology, it may seem detached from the domain of organisational learning as a knowledge field. However, if we take a broader and deeper view of the issues which are at stake in the study of organisational learning as a dynamic, continuous and complex process, then it is critical that the insights from these apparently far away areas are translated and incorporated into the organisational learning discipline.

Herbert Simon (1991), who was working also within the field of computing technology and artificial intelligence, has dedicated his work to a

very broad range of subjects which included the development of complex systems theory. In fact, he started his research considering the issues of organisational endeavours:

«... administration is not unlike play-acting. The task of the good actor is to know and play his role, although different roles may differ greatly in content. The effectiveness of the performance will depend on the effectiveness of the play and the effectiveness with which it is played. The effectiveness of the administrative process will vary with the effectiveness of the organisation and the effectiveness with which its members play their parts.» (Simon, 1991)

Simon calls attention to the fact that «complexity is more and more acknowledged to be a key characteristic of the world we live in and of the systems that cohabit our world.» (1991). He ascertains that though science has been focusing on complex systems through the study of astronomy, economics, biology or psychology, what is relatively new today is the study of complexity in its own right. As complexity, or systems science, is too general a subject to have much content, then particular classes of complex systems become the focus of attention, and that is how H. Simon explains the emergence of the study of chaos or hierarchical systems.

Simon (1991) defines complex systems as made up of a large number of parts that have many interactions, and states that formal organisations have a clearly visible parts-within-parts structure, thus implying that they are social systems. Other examples of social systems that he mentions are families, villages and tribes. He refers to biological and to physical systems and also to «one very important class of systems: systems of human symbolic production», citing the example of a book or a musical work. Simon's work is itself highly complex though here we are merely referring to simple descriptions and examples with the intention of illustrating the basic links between organisational learning and systems theory.

8 ORGANISATIONAL LEARNING, APPRECIATIVE INQUIRY AND SOFT SYSTEMS THEORY

Still within the broad area of systems theory, the development of human and social related approaches greatly resembles one of the core aspects of the organisational learning field that it deals with people. The term 'people' represents not only single autonomous individuals or collections of

independent autonomous individuals, but persons who are part of social practices and of social structures. The etymology of the word 'person' means individuals in relationship. These 'individuals in relationship' are simultaneously determined by the practices and structures to which they belong, as well as they themselves partly determine those practices and structures.

Peter Checkland is a theorist who has worked in systems theory for over thirty years and gives the following account (1999):

«Although history of thought reveals a number of holistic thinkers – Aristotle, Marx, Husserl among them – it was only in the 1950s that any version of holistic thinking became institutionalised. The kind of holistic thinking that came to the fore, and was the concern of a newly created organisation, was that which makes explicit use of the concept of 'system', and today it is 'systems thinking' in its various forms which would be taken to be the very paradigm of thinking holistically.» (1999)

The same author (1994) refers to the importance of two inquiring systems developed since the 1960s: soft system's methodology and Vickers' concept of appreciative inquiry (1965). He claims that these are highly relevant to the twenty first century, as both assume that organisations are more than rational goal-seeking machines, and address the relationship-maintaining and *Gemeinschaft* (translated as *Community*) aspects of organisations, obscured by functionalist and goal-seeking models of organisation and management. Checkland states that appreciative systems theory and soft systems methodology enrich rather than replace these approaches.

Checkland had previously summarised Vickers' main themes and broad description of appreciative systems theory (Checkland and Casar, 1986) as:

- A rich concept of day-to-day experienced life
- A separation of judgements about what is the case, *reality judgements*, and judgements about what is humanly good or bad, *value judgements*
- An insistence on relationship maintaining as a richer concept of human action than the popular but poverty-stricken notion of goal seeking
- A notion that the cycle of judgements and actions is organised as a system

Checkland also explains that soft systems methodology was not an attempt to operationalise the concept of an appreciative system (1994). Rather, it was after soft systems methodology had emerged from an action research programme at Lancaster University that it was discovered that its process mapped to a remarkable degree the ideas that Vickers had been developing in his books and articles (Checkland, 1981, cited in 1994).

Checkland continues to explain that the Lancaster programme began by setting out to explore whether or not, in real-world managerial rather than technical problem situations, it was possible to use the approach of systems engineering. He states that it was found to be too naïve in its questions to cope with managerial complexity: 'What is the system? What are its objectives?' Checkland continues (1994): «We can now say that managerial complexity was always characterised by conflicting appreciative settings and norms.»

An interesting parallelism between systems theory and organisational learning theory is that soft systems methodology was characterised as a learning system (Checkland and Scholes, 1990, cited in 1994): «... a *learning system* in which the appreciative settings of people in a problem situation – and the standards according to which they make judgements – are teased and debated.» And Checkland continues to clarify: «The influence of Vickers on those who developed soft systems methodology means that the action to improve the problem situation is always thought about in terms of managing relationships – of which the simple case of seeking a defined goal is the occasional special case.»

The need for organisational learning, as a practice, to incorporate the decades old lessons of appreciative inquiry and soft systems theory is not so much a mentalistic or intellectual exercise. It is more a question of experiencing organisational learning through the eyes of new approaches – new in terms of daily and standard organisational practices. It is related to how the actual reality is interpreted and then reinterpreted through new learning experiences.

CONCLUSION

The current paper gives a general account of several origins of the organisational learning field and it focus on key foundational issues which are relevant to the future development of the field.

Organisational learning design, through a special attention to the processes, structures, strategies, methods and tools which support and continuously maintain learning, is highlighted as an essential element on any project that has an intention to apply the organisational learning approaches to a real life situation.

Often continuous improvement methodologies as well as organisational learning projects fail to grasp the benefits subjacent to these conceptual tools because they are not able to understand three central issues.

One is that any organisational restructuring process must take into account the organisation as a whole. In order to do this, it is necessary to understand the concept of holism, and systems theory is one way of enabling this perspective to be applied.

Secondly, the issue of social and human characteristics which permeates every aspect of organisational life must be considered and understood in a way that does not oversimplify reality. The early influence of the development of the appreciative inquiry is an example – there could be several other - of how these issues may be tackled.

Thirdly, the importance of complexity which is inherently and directly related to both previous issues. Humans are highly complex in themselves and organisations are obvious examples of complex systems. Complexity is particularly critical to practice and applied approaches such as is the case of the organisational learning knowledge area.

The central message to be delivered is the need for organisational learning to take a fuller *depth and breath* approach to the diverse and interdisciplinary influences which characterise its core identity as a management and organisational theory discipline.

REFERENCES

- Abrahamson, E., 1996. Management fashion. *Academy of Management Review*, 21(1), 254-85.
- Abrahamson, E., 1999. Lifecycles, triggers, and collective learning processes. *Administ. Science Quarterly*, 44(4), 708-40.
- Antal, A., Lenhardt, U. & Rosenbrock, R., 2001. Barriers to organisational learning. In A. Antal, M. Dierkes, J. Child and I. Nonaka (eds), *Handbook of Organisational Learning and Knowledge*. New York: Oxford University Press.
- Argyris, C. & Schön, D., 1978. *Organisational Learning: a Theory of Action Perspective*. Reading, MA: Addison-Wesley.
- Beer, M., 2000. Research that will break the code of change: The role of useful normal science and usable action science. In M. Beer and N. Nohria (eds), *Breaking the Code of Change*. Boston: Harvard Business School Press.
- Beer, M., 2001. How to develop an organisation capable of sustained high performance. *Organ. Dynamics*, 298(4), 233-47.
- Checkland, P. & Casar, A., 1986. Vicker's concept of an appreciative system. *Journal of Applied Systems Analysis*, 13, 3-17.
- Checkland, P. & Scholes, 1990. *Soft systems methodology in action*. Chichester: Wiley.

- Checkland, P., 1993. *Systems Thinking, Systems Practice*. Sussex, UK: Wiley.
- Checkland, P., 1994. Systems Thinking and Management Thinking. *American Behavioural Scientist*, 38 (1). USA: Sage.
- Checkland, P., 1999. *Soft Systems Methodology: a 30-year retrospective*. Sussex, UK: Wiley.
- Cowan, D., 1995. Rhythms of learning: Patterns that bridge individuals and organisations. *Journal of Management Inquiry*, 4(3), 222-46.
- Dixon, N., 1999. *The Organisational Learning Cycle*. Hampshire, England: Power Publishing.
- Emery, F. & Trist, E., 1969. Sociotechnical systems. In F. Emery (ed), *System Thinking*. Handsworth: Penguin.
- Friedman, V., Lipshitz, R. & Overmeer, W., 2001. Creating conditions for organisational learning. In A. Antal, M. Dierkes, J. Child, and I. Nonaka (eds), *Handbook of Organisational Learning and Knowledge*. New York: Oxford University Press.
- Garvin, D., 2000. *Learning in Action*. Boston, MA: Harvard Business School Press.
- Gibson, J. & Tesone, D., 2001. Management fads: Emergence, evolution, and implications for managers. *Academy of Management Executive*, 15(4), 122-33.
- Hedberg, B., 1981. How organisations learn and unlearn. In P. Nystrom and W. Starbuck (eds), *Handbook of Organisational Design*. New York: Oxford University Press.
- Kearmally, S., 1999. *When economics means business*. London: Financial Times Management.
- Lillrank, P., Shani, A. & Lindberg, P., 2001. Continuous improvement: Exploring alternative organisational designs. *Total Quality Management*, 12(1), 41-55.
- Marquardt, M & Reynolds, A., 1996. Learning across borders. *World Executive Digest*, May, 22-5.
- Marsick, V. & Watkins, K., 1997. Lessons form informal and incidental learning. In J. Burgoyne and M. Reynolds (eds), *Management Learning: Integrating Perspectives in Theory and Practice*. London: Sage.
- Maturana, H. & Varela, F., 1980. *Autopoiesis and Cognition: The realisation of the Living*. Dordrecht: Reidel.
- Menzies, I., 1960. Social systems as a defence against anxiety. In E. Trist and H. Murray (eds) 1990. *The Social Engagement of Social Science, Vol. 1: The Socio-Psychological Perspective*, London: Free Association Books.
- Miller, E. & Rice, A., 1967. *Systems of Organisation: The Control task and Sentient Boundaries*, London: Tavistock Publications.
- Moingeon, B. and Edmondson, A., 1996. *Organisational Learning and Competitive Advantage*. Thousand Oaks, CA: Sage
- Obholzer A. & Roberts, V., 1994. *The Unconscious at Work*. London: Routledge.
- Popper, M. & Lipshitz, R., 1998. Organisational learning mechanisms: a structural and cultural approach to organisational learning. *Journal of Applied Behavioural Science*, 34(2), 161-79.
- Prange, C., 1999. Organisational learning - desperately seeking theory? In J. Burgoyne and L. Araujo (eds), *Organisational Learning and the Learning Organisation: Developments in Theory and Practice*. Thousand Oaks, CA: Sage.
- Pursuer, R. & Cabana, S., 1998. *The Self-Managing Organisation: How Leading Companies are Transforming the Work of Teams for Real Impact*. New York: The Free Press.
- Raelin, J., 2000. *Work-Based Learning*. New Jersey: Prentice Hall.
- Rami, A. & Docherty, P., 2003. *Learning by Design*. Oxford UK: Blackwell Publishing.
- Schein, E., 2002. The anxiety of learning. *Harvard Business Review*, 80(3), 100-6.
- Senge, P., 1990. *The Fifth Discipline*. New York: Doubleday.
- Shani, A. & Stjernberg, T., 1995. The integration of change in organisations: Alternative learning and transformation mechanisms. In W. Pasmore and R. Woodman (eds), *Research in Organisational Change and Development*, vol. 8. Greenwich, CT: JAI Press, 77-121.
- Simon, H., 1991. *The Sciences of the Artificial*. USA: MIT Press.
- Stebbins, M. & Shani, A., 2002. Eclectic design for change. In P. Docherty, J. Forslin and A. Shani (eds), *Creating Sustainable Work Systems: Emerging Perspectives and Practice*. London: Routledge.
- Thrist, E., Higgin, G, Murray, H. & Ollock, A., 1963. *Organisational Choice*. London: Tavistock Publications.
- Ulirich, D., Jick, T. & Von Glinow, M., 1993. High impact learning: building and diffusing learning capability. *Organisational Dynamics*, 22(2), 52-66.
- Vickers, G., 1965. *The art of judgement*. London: Chapman & Hall.
- Wickham, J., 2000. Understanding technical and organisational chance. In *Towards a Learning Society: Innovation and Competence Building with Social Cohesion for Europe*. Dublin: Employment Research Centre, Dept of Sociology, Trinity College Dublin.
- Winograd, T. & Flores, F., 1986. *Understanding Computers and Cognition – a new foundation for design*. Reading, MA: Addison-Wesley.