Open Research Online

Systemic development at Hawkesbury: some personal lessons from experience

Journal Item

For guidance on citations see FAQs.

oro.open.ac.uk

SYSTEMIC DEVELOPMENT AT HAWKESBURY: SOME PERSONAL LESSONS FROM EXPERIENCE

Richard Bawden[1][*]

[1] College of Agriculture and Natural Resources Michigan State University, East Lansing, Michigan USA

ABSTRACT

One of the most significant and enduring ideas associated with the systems initiatives at Hawkesbury has been the inter-connections that were made there between systemic acts of development in the 'concrete world' and the abstract 'epistemic developments' of the actors who participate in them. Each is seen to be constitutive of the other in a profoundly systemic manner, with 'concrete events' being both influenced by and an influence on 'abstract ideas'. The embrace of critical experiential strategies, which themselves are regarded as essentially systemic and reflexive in nature, has been a central feature of the pedagogies, research processes, and engagement strategies that have been designed to better facilitate this inter-connection. As calls for more sustainable and equitable forms of development gather momentum across the globe, and the citizenry become increasingly engaged with issues that are seen to pose significant systemic global risks, the need for collective, communicative experiential strategies as systemic discourse, becomes evident.

[*] Address for correspondence: Richard Bawden 331 Natural Resources Building, Michigan State University, East Lansing Michigan 48824 USA.

Key words: systemics, systemic development, epistemic development, agriculture, experiential learning

PROLOGUE

At the conclusion of the Crete Symposium within the ISSS conference, a delegate, previously unaware of the nature and extent of the Hawkesbury systems initiatives in agriculture, social ecology and rural development, asked me a surprising question: From all the experiences that I had had in my own twenty year tenure at Hawkesbury, what was the one, single most significant lesson that I had learned there that influenced what I had been doing in the four years or so since my translocation to Michigan State University in the USA?

Somewhat taken aback by such a seemingly reductionistic inquiry at a Systems Conference - for never before had I been asked to either prioritize or personalize my learning - I replied that I would give the matter some thought and get back to him!

It would not be an easy task: The whole Hawkesbury experience had, after all, been one long learning journey characterized by a sustained appreciation of the ever-changing braid of ideas and events as our history had unfolded over a quarter of a century - to borrow from the evocative metaphor of Vickers (1983).   Furthermore, one of the many extraordinary features of the Hawkesbury systemic initiatives has been their emergent nature through collective endeavours and the continual sharing of new experiences and

2

developing scholarship, and thus it has always been extremely difficult to separate the 'I' from the 'we'. And then finally there was the matter of my own changed circumstances – not just in institutions and indeed nations as well, but in the whole focus of my attention: At Hawkesbury I had been concerned primarily with the systemic development of one Faculty in the context of its changing role within the systemic development of rural Australia, whereas in my present position I focus essentially on the role of an American Land Grant University in 'international development' within a context of 'sustainability'.

Not one to shrink from a challenge however, or to explore a familiar scene from an unfamiliar perspective, I have been giving the question some very considerable thought. What follows here then is a piece in which I try to collect those thoughts into a coherent narrative. It is not the paper that I had originally prepared for Crete - for that was still written within the genre of a third-party historical commentary *about* Hawkesbury. In contrast, this is a personal narrative that reflects what I think were the most valuable lessons for me from our systems initiatives. The story is essentially the identification and subsequent exploration of a 'framework of key ideas' that while born during my Hawkesbury days, has proved to be enduringly useful for my post-Hawkesbury work. Perhaps the most important feature here however, is the meta-text that probably best illustrates my own systemic development as a learner and how I have come to relate ideas and experiences in a systemic, emergent, and critically conscious manner. In recognition of the very many scholars who have influenced my learning I have somewhat exceeded the conventional quota of citations.

Cutting to the quick with my answer to my questioner: the most important lesson that I learned from my Hawkesbury days is that *inclusive development of well-being within any complex and messy context (such as agriculture within its natural and cultural environments) is a critical function of the intellectual and moral development of all of those who are directly involved in, and or affected by, such development endeavors.*

INTRODUCTION

Accepting the notion of development as 'actions for improvement', or movement towards more mature or advanced states, I have come to appreciate the profound significance of approaching the 'rural problematique' in three highly inter-dependent dimensions: (i) ideas and actions to improve the world about us, (ii) ideas and actions to improve the way we generate ideas and actions to improve the world about us, and (iii) ideas and actions to improve our intellectual and normative capacities to improve the way we generate ideas and actions etc. In other words, I am not content that people in development situations merely identify and accommodate relationships between worldviews (or paradigms) and developmental transformations in the material world of 'people and things'. Rather, I believe that worldviews themselves need to be consciously developed. In essence, I believe that complex development tasks in the 'material world' of people and nature demand the development of epistemic states which themselves are complex and which in turn allow an appreciation of complexity.

It is this 'three dimensional' view of the quest for betterment that I refer to as *systemic development* where the ultimate goal is people learning *to be systemic* in the manner by

which they deal with others as well as nature itself, rather than merely learning how to be systems thinkers or how to master systems practices. Extending a key thesis of Marcia Salner (1986), in which she argues that the development of epistemic competence is crucial for 'general systems learning, I submit that the same is even more accurate for the development of 'systemic capabilities'.

I am confident in claiming that the Hawkesbury systems initiatives of the past quarter of a century or so have clearly illustrated critical relationships between the conscious development of epistemic abilities and their expression in systemic competencies, in a context of people working in a complex, dynamic and 'hybrid' world in which "all of culture and all of nature get churned up again every day" (Latour 1993). The work has also illustrated the vital role that experience plays both in the development of what Freire (2003) referred to as 'critical consciousness', and as the 'source of learning' about which John Dewey (1910) was so adamant. Both of these seminal thinkers were concerned with connections between experience, learning, and democracy, and it is these same connections that lie at the very heart of the contemporary call for development on a global scale to embrace freedom as its essential focus, rather than the generation of wealth (Sen, 1999).

In these contexts, *experience* has a much more systemic connotation than merely the use of the senses to detect changing physical surroundings or to empirically recognize simple problems: Experience "recognizes in its primary integrity no division between act and material, subject and object, but contains both in an unanalyzed totality" (Dewey, 1910):

"Like its congeners, life and history, it includes *what* men (sic) do and suffer, what they strive for, love believe and endure, and also *how* men act and are acted upon, the ways in which they do and suffer, desire and enjoy, see, believe, imagine – in short, processes of *experiencing*". Yet again, there is little evidence to suggest that experience is experienced or conceptualized in this 'holistic' manner within universities, yet actually not knowing "what makes up our world of experience, which is the closest world to us, is a crying shame..[for]... there are many things to ashamed about in this world, but this ignorance is one of the worst" (Maturana and Varela 1987).

There have been some notable attempts to do something about this situation: Dewey's rich integrated picture of experience for instance, has been adopted by Kolb (1984) who gives considerable credit to Dewey as well as to Piaget and Lewin in his own very significant work on experience as the source of learning and development and its interpretation into a process of experiential learning. Such learning, Kolb argues, is a continuous, transactional, developmental and holistic process of adaptation to the world that "is not the special province of a single specialized realm of human functioning such as cognition or perception …[but]…involves the integrated functioning of the total organism – thinking, feeling, perceiving and behaving" (Kolb, 1984).

One of the early insights at Hawkesbury (cf Bawden et al., 1984) was the reconceptualization of Kolb's 'experiential learning cycle' as a 'learning system' which was further enriched with its later interpretation as an embedded 'system of systems' (Bawden, 1991) as inspired by the three level model of cognitive processing developed by Kitchener (1983) and especially her reference to epistemic cognition. The elegant

and persuasive work of Salner (1986) then prompted the further crucial ideas of the epistemic development of learning systems, of the relationships between epistemic development and the development of systemic competencies, and the role of experiential stimuli in promoting both. The essence here is that of paradigmatic challenge where the aim is to confront people involved with the process of (rural) development in such a manner that it reflects genuine paradigmatic challenge to what Kuhn (1962) referred to as those "entire constellations of beliefs , values , techniques and so on shared by members of a given community".   The key to shifts in paradigms – akin, as he argued from his context, of scientific revolutions – lay with a growing sense within communities "that an existing paradigm has ceased to function adequately in the exploration of an aspect of nature to which that paradigm itself had previously led the way" (Kuhn, 1962). From my perspective, the essence of the Hawkesbury systems initiatives were all about exploring alternative foundations for development paradigms and in the process of critically questioning conventions, many of us we were to personally discover the essential truth of another of Kuhn's claims - that scientific (and development) revolutions bring on 'fierce controversies, international name-calling and the dissolution of old friendships' (Kuhn, 1972). Even the simple notion of a focus on development itself was taken as confrontational, to say nothing of the reaction to our radical adoption of both experiential and 'systems' principles and practices that we argued as appropriate not only to the situation with respect to agriculture in Australia but also to the world beyond: The domain in which I focus my current efforts in systemic development.

A GLOBAL PROBLEMATIQUE

Irony, tragedy and paradox alike confront all agriculturists who turn their attention to the full complexities of the global problematique within a context of the 'quest for betterment' that development connotes. And given that agriculture is the essential source of food for the planet's six billion human inhabitants that means everyone on earth is part of the 'area of concern' for those who would be involved with its development internationally. More than simply amplification of national situations, agriculture when viewed from a global perspective has emergent properties that reflect the dynamics of the very process of globalization itself.

The irony, albeit with little humour to it, lies with the fact that the modernization of agriculture has long harboured the seeds of its own demise – if not even ultimate destruction. In its present form, agriculture, it is increasingly claimed, is not sustainable (Douglass, 1984) from whatever perspective of the panoply of different interpretations that the concept of sustainability presents (Davison, 2001). Modernized agriculture, with its twin foci of attention exclusively on technological production and economic productivity, has brought with it a litany of unwanted and undesirable socio-cultural and bio-physical environmental impacts. It is a perfect exemplar of the thesis of Ulrich Beck (1992) that "in the course of the exponentially growing productive forces in the modernization process, hazards and potential threats have been unleashed to an extent previously unknown". In addition to the production of 'goods' Beck argues, the process of modernization in general, has also resulted in the output of 'bads' which is on such a scale that we have become a 'risk society' where "unknown and unintended

consequences come to be a dominant force of history and society" (Beck, 1992). Pesticide pollution of the environment, chemical and pathogen contamination of food, reduction of biodiversity, deforestation of land and consequential erosion and desertification, displacement of people by machines and subsequent rural unemployment, the concentration of ownership within the agri-industrial complex, and the sometimes ideologically motivated relationships between transnational companies, international development agencies, and governments (Perkins, 1997), are all examples of the 'bads' that are contributing to the risk society on a truly global scale. All are intrinsically complex matters that engage the emotions, the morals and the intellect alike and adding further to this complexity is the introduction into agriculture of the bio-technologies that involve genetically modified organisms (GMOs) which come with the promise of bringing 'good' but also with potential for 'bad' that is currently unknown – perhaps even unknowable for there are, as Krimsky (1995) observes, a host of cultural and symbolic dimensions to agricultural biotechnology that introduce further complexities yet to the 'good'/'bad' dichotomy.

While this is all tragic in itself, the even greater tragedy is that for all of their developmental endeavours of the past and present, agriculturists must face the reality that hunger, starvation, and poverty continue to characterize the lives of billions across the globe with the vast majority in the so-called 'third world. In the so-called 'developing' or 'less developed nations' of this world, a significant proportion of the population are still rural dwellers and huge numbers are themselves farmers. Meanwhile the process of globalization of what is increasingly referred to as the 'agri-food system' continues

apace, driven as it is by the forces of capitalism marked by "the development of global financial markets, the growth of transnational corporations, and their increasing domination over national economies" (Soros, 2002). These forces are not directly addressing the tragedies nor are they necessarily helping to alleviate them; indeed under many circumstances, they are actually exacerbating them under circumstances where "the logic of existing institutions and norms appear unable to accommodate developments in agriculture…[where]..both agriculture and policy for agriculture is global in reach" (le Heron, 1993).

The paradox is that the paradigm of science-based techno-economic development, which some see as an actual 'betrayal of development' (Norgaard, 1994), contains to prevail even though it is clearly proving to be hopelessly inadequate in the face of the complexity of the issues. Like all modern sciences, agricultural science is guilty of fundamentally misconceiving the world, "by fragmenting reality, separating observer from observed, portraying the world as a mechanism and dismissing non-objective factors all in the name of the domination of nature" (Orr, 1992). In its persistence with distinctions between people and nature, its compartmentalism of scientific disciplines into the social sciences, with a marked privilege afforded to economics, and the bio-physical sciences, it is essentially denying the intricate inter-connections that clearly exist among people and between people and nature. Poverty and hunger and destitution are all examples of what Latour refers to as 'hybrid' issues, "imbroglios of science, politics, economy, law, religion, technology, fiction" (Latour 1993): So too are climate change, BSE or mad cow disease, HIV-aids, genetically modified organisms, social inequities, the quest for

sustainable livelihoods, and indeed the process of globalization itself, which are all matters that are central to the responsible development of 'agri-food systems'. All of these issues have dimensions that demand ethical and aesthetic and spiritual and cultural attention in addition to the techno-scientific and economic metrics upon which conventional agricultural development has exclusively focused.

Perhaps even more paradoxical - and concurrently ironic and tragic - is that by the positivist 'frameworks of ideas' that it embraces, the reductionist methodologies that it employs, and the objectivist stance that it takes in selecting its 'areas of concern', the prevailing paradigm of agricultural development, reflecting the nature of classical empirical science (Miller, 1983), is unable to recognize its own inadequacies. And yet, where science, technology and neo-liberal economics have been historically seen to reduce uncertainties through the rational knowledge that they 'generate', "many of the uncertainties which face us today have been created by the very growth of human knowledge" (Giddens, 1994). This state of affairs, it is being argued, is being exposed by the increasing failure of public sectors to deliver essential services, by a recognition of the speciousness of modernism as culture, and by levels of resource depletion and environmental degradation "that now endanger many and threaten the hopes of all to come" (Norgaard, 1994).

Among the outcomes of the techno-economic stance in general, has been the rise to dominance of instrumental rationalist knowledge over others ways of knowing (Habermas, 1970) and an elevation of scientists to "experts" who "tacitly and furtively

impose prescriptive models of the human and the social upon lay people, and these are implicitly found wanting in human terms" (Wynne, 1996). This in turn has led to a "culture of technical control" (Yankelovich, 1991) and of 'cognitive authoritarianism' where "the rationality of thinking for oneself diminishes as society's knowledge gathering activities expand to the point of requiring a division of cognitive labor into autonomous expertises" (Fuller, 1988). The host of normative issues that clearly lie at the heart of this matter are sufficient to support the call for a new moral imperative for agriculture (Thompson 1998), and yet by its very nature, 'normal' positivistic agricultural science has little paradigmatic capacity to deal with ethical matters. Neo-liberal economics, on the other hand, has taken the opposite stance, by itself becoming "a social and moral philosophy" in which "the existence and operation of a market are valued in themselves" and "where the operation of a market or market-like structure is seen as an ethic in itself, capable of acting as a guide for all human action, and substituting for all previously existing ethical beliefs" (Treanor, 2004). Yet, as Sen (1988) argues, there is little evidence for the claim that the maximization of self-interest provides the best approximation of human behaviour or that it leads necessarily to optimum economic conditions. Accordingly, and drawing significantly on the work of Adam Smith, he argues for a radical re-appraisal of the relationships between economics and ethics while emphasizing that this would be a mutual exercise in which both disciplines would benefit.

Clearly there is an urgent and a profound need for changes to occur in conventional development thinking and practices alike, for the issues truly are paradigmatic. However, as Kuhn (1962) emphasized, paradigmatic shifts do not come easily, and the "transfer of allegiance from one paradigm to another is a conversion that cannot be forced". Sen is

also appreciative of the difficulties that the exercises that he suggests to bring economics and ethics into closer contact with each other would not be particularly easy for they involve "deep seated ambiguities and many of the problems are inherently complex" (Sen, 1988).

Thus while a shift to systemic development is increasingly indicated, it will not be easy, as indeed the Hawkesbury initiatives indicated in spite of the appeal of, and rhetorical embrace at least, of the key point of its logic by many people beyond that institution.

A LOGIC FOR SYSTEMIC DEVELOPMENT

The following particular 12-point logic derives from both personal and collective scholarship at Hawkesbury and beyond, as reinforced by personal and shared experiences. It supports the call for systemic development for 'agri-food systems' across the globe that are being increasingly globalized through a techno-economic imperative that by its current nature some see as actually "betraying progress by leading us into, preventing us from seeing, and keeping us from addressing interwoven environmental, organizational and cultural problems" (Norgaard, 1994).

Thus:

1. The responsible development of a multi-functional agriculture within an integrated context of the socio-cultural and bio-physical environments in which it is embedded is a complex, dynamic, and multi-dimensional task.

2. Conventional techno-economic approaches to agricultural development have tended to extract it from its broader context and to essentially focus on production and productivity as the sole expressions of improvement, and, exclusive of civil society, rely essentially on the state and on the market as two essential domains of development.

3. These reductionist approaches have come to exemplify the 'crisis of modernization' where, in spite of the fact that 'bads' as well as 'goods' are produced on a truly global scale, the paradigms themselves are incapable of reflexivity – by the very nature of the their epistemic foundations.

4. The universal need for food and the life-sustaining connections between all people and the planet means that agriculture is a major issue of global concern and as such, its future developments ought to be matters for public judgment on a truly global scale.

5. Public judgments about 'better' agricultures need to embrace ethical, aesthetic, cultural, political, ecological, and even spiritual dimensions of development, in addition to the economic, technological, social and legal ones to which conventional development approaches typically restrict their attention.

6. Such multi-dimensional views of development draw attention to the need for multi-dimensional worldviews and epistemic developments that embrace such complexity while being themselves complex.

7. Systemic approaches to development are grounded in the belief that epistemic foundations can be both challenged and changed through 'movements to a more

advanced states' which themselves reflect complex evaluative positions involving epistemological, ontological and axiological features.

8. Experiential stimuli which include social interactions between critically conscious people, are essential as triggers for a 'maturation' of both the intellectual and moral dimensions of epistemic developments that characteristically 'progress' from dualistic assumptions about the world and how we come to know it, to those that are grounded in a contextual relativism that demands continual commitment to experiential refinement.

9. The development of systemic competencies depends essentially on the development of epistemic states that both reflect and appreciate the complex evaluative criteria that are fundamental to effective and responsible public judgment.

10. The development of forms of public discourse that explicitly focus on critical consciousness within the 'citizenry' is a fundamental pre-requisite for the development of epistemic awareness which in turn is essential for systemic appreciation.

11. Institutions of education and research, development organizations, organs of government, and the media, in needing to assume significant responsibilities for the development of such discourses, need also to develop ways of engaging with civil society as well as with each other in a manner quite different from a contemporary position which privileges distinctions between 'the expert' and the 'lay-person'.

12. While the challenges of systemic development are global in their relevance, they need attention at all 'levels' of social organization and by institutions that operate at all of these levels within civil society.

Experience suggests that while the logic of the dozen theses above is appealing, they prove very difficult to operationalize within conventional educational institutions, at least those concerned with the development of agriculture.

AN EXPLICATION OF EPISTEMIC DEVELOPMENT

Under the present circumstances of the 'state of the world' as outlined above, it is amazing and also, it might be argued, ethically indefensible that academic communities concerned with teaching research, or outreach service in agricultural institutions of higher education at least, do not typically adopt *development* as an explicit focus for either the process or the content of any of their conventional missions.

In the context of *process* alone, with all the research that has been done into intellectual and ethical/moral development and in cognitive science, for instance, one would expect to find curricula designed specifically to facilitate such theory-informed development. There is ample research evidence for instance, to support the thesis that prior knowledge, beliefs, skills and experiences have a major influence both on what is learned from subsequent experiences and how it is both learned and contextualized (Piaget, 1972), (Vygotsky, 1978). In this manner we not only come to know 'more' about the nature of the world about us, but also to develop different ways of knowing and different assumptions about the very nature of knowledge itself. In essence, our experiences in life promote a sequence of intellectual and moral development in each of us, that in essence strongly suggests that "knowledge structures and the process through which information

is organized and made usable, can progress from a state of simple absolute certainty into a complex, evaluative system" (West, 2004). Yet rarely, if ever, are cognitive theories and epistemological concepts such as these used explicitly to inform curricular design: Worse yet "[w]e do not in our colleges today make use of any learning principles in a considered systematic, professional way. We do not design the college as a learning environment" (Simon, 1977): And all of this is in spite of a general espousal of the idea within the academy, of higher education and research as the quests for 'more advanced states' of knowledge and more mature, critical ways of knowing.

One of the central connotations of the word *development* is, after all, the movement to a more mature (and often more differentiated and complex) state, and that must include the state of mind that can recognize that state!

We can know and we can come to know how we know. We can also come to know about knowledge itself and about the limits to knowing, as suggested by Bateson (1972), in his explication of different 'levels of learning', by Mezirow (1991) with his work on transformative adult learning, and by Kitchener (1983) with her tri-level model of cognitive processing. But by and large, within the academy, we don't bother to even recognize such distinctions, let alone use them to organise our pedagogies. As a consequence there are those who firmly believe that "the core of all of the troubles that we face today is our very ignorance of knowing" (Maturana and Varela, 1987) so that "our personal life is generally blind to itself". So too, some suggest, is our institutional life, for our institutions both reflect our beliefs and behaviours and norms while in turn reinforcing them (Giddens, 1984). We are characteristically non-reflexive either as

individuals or as institutional collectives – as the old adage has it with its clever use of words, we do not even know that we have an epistemology, let alone what it is!

The classic longitudinal research of William Perry with undergraduate students at Harvard University emphasises the vital importance of self-reflexivity. His work provides a signal example of the nature and significance of both intellectual and ethical development (Perry, 1970) with a particular emphasis on epistemology. He was to essentially conclude from his decade-long study, that "aspects of intellectual and ethical development in late adolescence can be described in an orderly way" (Perry, 1970) and he developed a complicated schema that identified nine different positions or stages through which a majority of the students that he studied, 'moved developmentally'. Perry's schema reflects three successive epistemological positions - *dualism*, *multiplicity* and *contextual relativism* – while emphasising further intellectual development in the name of *commitment* that the students made when faced with the uncertainties of 'a relativistic world'.

Salner (1986) concluded that Perry's work related specifically to "structural reorganization of epistemic assumptions in the direction of increasing complexity" and suggested that this had profound implications for "general systems learning". The notion of epistemic assumptions she drew from the work of Kitchener who introduced 'epistemic cognition' - where the concern was "reflections of the limits of knowledge, the certainty of knowledge and the criteria of knowing" - as the third level of her three level model of cognitive processing (Kitchener, 1983). Perry's work explicitly emphasized vital connections between epistemological and ethical development, which is a theme that

both Kohlberg (1964) and Hoffman (1970) also pursued, although with moral development as the primary focus in both of their instances. They were both concerned with pre-adolescent development – the former from a perspective of how children develop a sense of 'right', and the latter, a sense of 'good'. In a recent text, in which he first reviews and then extends the work of both Kohlberg and Hoffman, Gibbs (2004) explores ontological connections between moral development and reality from which he concludes from a perspective of human inter-connectedness, that "acts that wrong and harm one individual…ultimately wrong and harm us all".

Given the close connection that these scholars have identified between epistemological, ontological, and axiological assumptions, it is useful to extend the use of the phrase epistemic development to embrace development with respect to all three.

Other researchers including Belenky et al., (1986), Baxter Magolda (1992) and King and Kitchener (1994) have further enriched understandings of epistemic developments and in some cases have extended the work to include lifelong epistemic development (Kitchener and Fisher, 1990). These studies strongly suggest that there is high degree of transferability across different models that all show an essential progression of epistemological development 'from the simple to the complex' (West, 2004). These epistemic changes, which embrace both epistemological and normative dimensions, are triggered essentially "through the assimilation of experiential stimuli" (West, 2004). This is an important aspect of Salner's thesis in arguing that "students must have the opportunity to *experience* (emphasis in the original) the epistemological dilemmas that characterize each stage as his or her own personal dilemmas": and furthermore they must be "emotionally able to contend with the temporary stress induced by such dilemmas or

mental blocks are unconsciously erected to slow the pace of cognitive change" (Salner, 1986).

As she was to further postulate, this matter is of fundamental concern to those who seek to develop (and help others to develop) systemic understandings, for these come only in association with epistemic consciousness and development from dualism through to contextual relativism and commitment. In process terms, the development of epistemic competencies appropriate to what she referred to as "general systems learning" is most likely to occur "when mild pressure in the environment toward movement is consistently present so that the student cannot conveniently escape the kinds of confrontations that produce growth" (Salner, 1986).

Two very important features of the Hawkesbury initiatives in this regard were (a) the participation of students in 'real world' situations from the very commencement of their programs, and (b) the major extent to which such participation involved 'learning groups' and 'group learning situations'. Students were thus constantly subjected to 'experiential confrontations' that involved social learning in situations that were designed deliberately to present with situations that, with time, became increasingly complex and messy (Bawden and Packham, 1993). They were in essence, critical learning systems in reflexive action, and this image turned out to be a very useful heuristic both for curriculum design and for conceptualizing a way of organizing social groups in a manner that reinforced for them, the essence of their own systemicity.

CRITICAL LEARNING SYSTEMS (CLS)

A critical learning system is a construct of a group of people who consciously organize themselves self-consciously if they were coherent and whole 'system' of interconnected 'learning sub-systems' that are collectively self-reflexive while together operating in environments with which they are structurally coupled and with which they are attempting to co-develop through learning processes (Bawden, 1994).

Ideas, principles, theories, philosophies and methodologies for the organization, structure and activities of critical learning systems are drawn from all three 'schools of systemics' of 'hard', 'soft' and 'critical' (Jackson, 2000). Furthermore, experience with its use as an heuristic in a wide diversity of circumstances indicates the nature of a fourth school – or, adopting Midgley's (2000) interpretation of the schools as 'waves of systems thinking', a fourth wave of systemics.

From the first or 'hard' school comes the idea that a group of people can be construed as a 'social system' of subjective and objective elements, which deliberately and consciously develops a sense of its own wholeness and the inter-connectedness of its own parts. This social system sees itself, in turn, as a learning subsystem within different agroecological systems – farming systems, 'agri-food systems', rural systems etc - that are themselves embedded in both socio-cultural and bio-physical environmental supra-systems which are often turbulent in character. Grounded in assumptions of 'objectivity in parenthesis' (Maturana and Varela, 1987), various 'hard' systems methodologies can be used to investigate possible 'interventions' which would lead to the further

development of the 'real world systems' while avoiding, or at least minimizing, any negative environmental impacts. The essential functions of the system from this perspective are based on fairly dualistic/positivistic onto-epistemological assumptions with a characteristic focus on instrumental rationality (Habermas, 1971). Importantly this 'paradigmatic worldview' limits the extent to which the critical learning system can be self-reflexive. Experiential learning is of the essence, as the learning sub-system seeks to transform its 'experiences' of the world about it into knowledge necessary to inform responsible actions in it and to it.

From the second or 'soft' school comes the shift in systemicity from the world to ways of inquiring into the world (Checkland, 1981). Rather than an emphasis solely on soft systems methodology which is seen to yield learning about the various elements of ideas framework, methodology, and area of concern (Checkland, 1985), it is the process of critically reflexive learning itself that is privileged. As 'an inquiring system' it is seen to comprise two fundamental subsystems – experiential and inspirational – through which meaning as the basis for meaningful action, is created through the transformation of 'experienced reality' and 'innate insight' respectively. This latter focus introduces a strong normative dimension that extends beyond 'rationality' and draws attention to the need to focus also on deontological ethical and aesthetic aspects of development. The significance of the crucial connection between transformations for 'situation improvement' and the worldviews of those involved in the transforming process is further extended to embrace, through explicit self-reflexivity, learning in all three dimensions of cognitive processing (Kitchener, 1983). This is given a 'systemic twist' by presenting

epistemic cognition as a context for both meta-cognitive and cognitive activities in what can now be considered a 'holarchy' of learning levels. The onto-epistemological assumptions of constructivism/contextual relativism are expressed through a focus on inter-subjective knowing, discourse, and 'communicative action' (Habermas, 1984) which in turn support the argument that "judgment is a genuine way of knowing" (Yankelovich, 1991) and an essential foundation for democracy and social justice. Debates about 'desirable and feasible change' as improvements in existing situations in the 'material world' must include a focus on the nature and dynamics of epistemic development.

From the third or 'critical school' comes a further shift in emphasis that reflects a number of different aspects of criticality. Drawing on Midgley (2000) the 'critical turn' in systems thinking calls attention to three foci that include (a) concern for power relationships within systemic interventions (cf Jackson, 1982), (Jackson,1991), (b) concern for conflicts built into the structure of society (cf Mingers, 1980), and (c) concern for the cultivation of emancipatory interests in the development process (cf Ulrich, 1983). Within the CLS construct, these are added to the concern for the epistemic and meta-cognitive implications for knowing and learning and for public judgment. Added also, is concern for the potential consequences of development interventions on both cultures and nature alike. Reflexivity thus now becomes multi-dimensionally critical. From this critical perspective, development is seen as the quest for a freedom from oppression, upon which it also depends (Sen, 1999). Thus to the goal of nurturing 'systemic competencies' of actors in the development process, Sen's notion of

capabilities extends systemic attention to include the provision of opportunities as well. This third dimension of criticality places a greatly increased emphasis in critical learning systems on axiological aspects of development of both the learning sub-systems themselves and of the 'world' in which they are attempting to systemically intervene. The emancipatory interest of Habermas (1984) is now privileged, and a critical pedagogy is indicated through which "the oppressed come to perceive the reality of oppression, not as a closed world from which there is no exit, but as a limiting situation which they can transform" (Freire, 2003). Appreciation of these dimensions of circumstances as context for development, come with a maturity that is reflected in the more advanced states of intellectual and moral development explicated by Kohlberg (1964) in terms of social contracts and individual rights, by Hoffman (1970) in terms of empathy and altruism, and by Perry (1970) in terms of personal identity and sense of being "in" one's life.

An important systemic perspective on the notion of stages of intellectual and moral growth has recently been proposed by West (2004) in which she argues that these stages "are hierarchically integrated such that the structure of each successive stage differentiates and reorganizes the knowledge constructed at the previous stage". Under these circumstances, it is perhaps more useful to conceptualize them as unfolding 'waves' rather than as discrete 'stages' or 'phases'. In this context, the decision by Midgley (2000) to refer to the three 'schools' of systems approaches as 'waves of systems thinking' suggests a strong correlation with the notion of waves of intellectual and moral development thus themselves reflecting a developmental sequence of this nature. There is also an interesting connection with the idea of 'waves of development' in agriculture that reflect a 'progression' of different paradigmatic assumptions (Bawden, 1990): And

24

we need to go further yet in the search for sustainability as an ethos for the way we cultivate the earth in ways where the production of 'goods' far, far outweighs the production of 'bads'.

CONCLUSION

In the spirit of continuing development, I would like to conclude this piece with a tentative submission that work in systemic development with critical learning systems indicates a fourth wave which again finds reinforcement in the idea of epistemic development and critical consciousness, although with an interesting twist of introducing the notion of the development of 'modes of consciousness' themselves!

My own lifelong experiences living and working in rural situations, as well as with my own sense of self and the way I have sought to express that through a preference for collective involvement and group participation throughout my life, strongly reinforce the suggestion by Jackson (2000) that "many people seem to be natural system thinkers". I am not sure that I agree with his second postulate however, that they often "recognize the need to have these natural instincts further refined". Even when such a recognition is made however, I am sure that the three waves of systems thinking and the methodologies that they promote necessarily reflect further refinements, for with their continued emphasis on rationality, in either instrumental or inter-subjective forms, they can still fail to allow the full human expression of 'being in the world'.

I am among those who suggest that many people are more than just systems *thinkers* but are born and/or bred with an innate sense of '*being systemic beings*' who have an inherent and profound sense of their inter-connectedness with others and with the world at large: Of experiencing a profound 'wholeness' both with 'nature' and 'culture' in which they participate with a consciousness that in their participation they are 'parts within a whole'. They reflect an appreciation of the notion that "[w]holeness means that all parts belong together, and that means that they partake in each other. Thus from the central idea that all is connected, that each is a part of the whole, comes the idea that each participates in the whole. Thus participation is an implicit aspect of wholeness" (Skowlimowski, 1985). Perhaps indeed, "a unity with the workings of Nature is potentially within each of us" as Penrose (1994) has suggested, and that our insights and sensitivities resonate with those workings. And perhaps there is an 'ecology of mind' as Bateson (1972) suggested with collective thoughts and knowledge that, as Bohm (1994) notes, are so automatic to us that we are in large part controlled by them.

There is a strong sense of the inspirational and intuitive here. Inspirational learning, in contrast to experiential learning, asks us not to immerse ourselves in the 'real external world of the concrete' (the sensual) nor to 'conceptualize the abstract' (the conceptual), but to 'disengage' from 'reality' and seek 'internal insight' through some form of meditation or contemplation (Bawden, 2000). This process will often encompass a spirituality that transcends the nihilistic tendencies of the existential that Kohlberg and Ryncarz (1990) argue "relies in part upon the self's particular and somewhat unique life experience". And this emphasis again on experience, in the richest sense of that word, evokes the work of Goethe with a 'science of conscious participation in nature' through

which he came to see the "wholeness of the phenomenon by consciously experiencing it" in a manner where "this experience cannot be reduced to an intellectual construction in terms of which the phenomenon is organized" (Bortoft, 1996).   As Bortoft argues, Goethe was concerned with the transformation of consciousness itself from "a piecemeal way of thought to a simultaneous perception of the whole" (Bortoft, 1996) leading to a state in which a relationship could be "experienced as something real in itself" within an 'holistic' context.

To the recent call by Alroe and Kristensen (2002) for a reflexive systemic research methodology for agriculture in which the empirical and normative aspects of science are integrated as two "key cognitive interests", I believe that we also need to incorporate a meta-physics that captures the essence of Goethe's holistic science while embracing moral philosophies and aesthetic appreciations born of our profound experiences of nature and culture alike. I also believe profoundly in the vital importance of 'holistic' experience and in the significance of systemic discourse as a 'methodology' for the forms of social learning that will be critical for responsible public judgments about future developments of 'agri-food systems' on both global and local scales.

What I have come to conclude is that the innate sense of systemicity that one so often encounters within rural communities, and most especially with farmers, is much more likely to be characterized by the features just presented as the 'fourth wave' than by any of its predecessors – vital though they are within their own perspectives.   If I were starting all over again on a systemic odyssey with the same level of commitment to

scholarship and to praxis and to systemic reform that my Hawkesbury colleagues sustained over a quarter of a century, this is where I would now suggest that we started.

EPILOGUE

On the very eve of this paper going to press, I received an email from an erstwhile Hawkesbury colleague which included a reference to a recent report that had been issued by an external review team of two eminent scientists of the current agriculture programs at the University of Western Sydney. The fourth recommendation struck my particular attention:

Recommendation 4:

> *That the use of the experiential learning approach as the over-riding philosophy for the teaching of agriculture should cease in favour of more conventional and well-proven pedagogical approaches, particularly in relation to the development and presentation of underpinning scientific knowledge.*

After all the evidence that was illustrated by the logic exposed in this article and by the scholarship that underpinned it, by the experiences that we had over a quarter of a century, and by the success of our graduates in helping shift the focus from agriculture to rural development in Australia, I am left wondering about what is meant by those "well-proven pedagogical approaches" to be introduced in the stead of experiential pedagogies. I also am bemused by the lack of connection being made between experiential knowing and "the development and presentation of scientific knowledge" – especially given that

the method of empirical science is quintessentially experiential in its character. What worldviews, I ask myself, shaped those responses? What level of intellectual and moral development do they express? What understanding do they illustrate of critical consciousness or the epistemic/systemic nexus? What appreciation do they show of the complexity of the problematique of agricultural modernization or of the irony, tragedy and paradox of the conventional paradigm that they seem so keen to re-introduce?

They end this section of their report with their belief that "it is time to formally conclude the use of this learning approach, to draw a line under the past and move forward": With this extraordinary sentiment, reflexivity is dealt a mortal blow and the opportunity for further lessons to be learned from the Hawkesbury experience with systems initiatives, presumably gagged from this point on!

As the old axiom has it, the only thing that humans seem to learn from history is that they learn nothing from history.

ACKNOWLEDGEMENTS

development of rural Australia over the years. I sincerely acknowledge my profound debt to all of them, and dedicate this piece to them.

I also want to pay a very special tribute to Diane, my late wife, who had died nine years earlier almost to the day of the Crete symposium. She, more than anyone else, appreciated the power of love and commitment that experience clearly shows is an absolutely vital feature of paradigmatic reform and of the paradigm of systemic development.

REFERENCES

Alrøe HF, Kristensen ES. 2001. Towards a systemic Research Methodology in Agriculture: rethinking the role of values in science. *Agriculture and Human Values* **19**: 3-23.

Bateson G. 1972. *Steps to an Ecology of Mind*. Ballantyne Books: New York.

Bawden RJ. 2000. Valuing the Epistemic in the Search for Betterment. *Cybernetics and Human Knowing* **7**: 5-25.

Bawden RJ. 1990. Towards Action Researching Systems. In Action Research for Change and Development. Zuber-Skerritt O. (ed). Griffith University Press: Brisbane. 21-50.

Bawden RJ. 1994. Creating Learning Systems: A Metaphor for Institutional Reform for Development. In Beyond Farmer First: Rural Peoples Knowledge, Agricultural Research

and Extension Practice. Scoones I, Thompson J. (eds). Intermediate Technology Publications: London

Bawden RJ. 1991. Systems Thinking and Practice in Agriculture. *Journal of Dairy Science* **74**: 2362-2373.

Bawden RJ, Packham RG. 1993. Systemic Praxis in the Education of the Agricultural Practitioner. *Systems Practice* **6** : 7-19.

Bawden RJ, Macadam RD, Packham RG, Valentine I. 1984. Systems Thinking and Practices in the Education of Agriculturalists. *Agricultural Systems* **13:** 205-225.

Bateson G. 1972. *Steps to an Ecology of Mind*. Ballantine Books: New York.

Baxter Magolda MB. 1992. *Knowing and Reasoning in College: Gender-related patterns in students' intellectual development*. Jossey-Bass: San Francisco.

Beck U. 1992. *Risk Society. Towards a new modernity*. Sage Publications:London.

Belenky MF, Clinchy BM, Goldberger NR, Tarule JM. 1986. *Women's Ways of Knowing: The development of self, voice and mind.* Basic Books: New York.

Bohm D. 1994. *Thought as a System*. Rutledge: London.

Bortoft H. 1996. *The Wholeness of Nature: Goethe's Way: toward a science of consciousness participation in nature.* Lindisfarrne Books: New York.

Checkland PB. 1981. *Systems Thinking Systems Practice*. John Wiley: Chichester.

Checkland PB. 1985. From Optimizing to Learning: a development of systems thinking for the 1990s. *Journal of the Operations Research Society* **36**: 757-767.

Davison A. 2001. *Technology and the Contested Meanings of Sustainability*. SUNY Press: Albany.

Dewey J. 1910. *The Influence of Darwin on Philosophy: And other essays on contemporary thought*. Holt, Rinehart and Winston: New York.

Douglass GK. 1984. Agricultural Sustainability in a Changing World Order. Westview Press.: Boulder., Col.

Freire P. 2003. *Education for Critical Consciousness*. Continuum: New York.

Fuller S. 1988. *Social Epistemology*. Indiana University Press: Bloomington, Ind.

Giddens A. 1994. Risk, Trust, Reflexivity. In Reflexive Modernization: Politics, tradition and aesthetics in the modern social order. Beck U, Giddens A, Lash S. (eds). Stanford University Press: Stanford, Calif.

Gibbs JC. 2003. *Moral development and Reality: Beyond the theories of Kohlberg and Hoffman.* Sage Publications: London.

Habermas J. 1970. Knowledge and Interest. In Sociological Theory and Philosophical Analysis. Emmet D, MacIntyre A. (eds). Macmillan: London.

Habermas, J. 1984. *The Theory of Communicative Action. Volume 1. Reason and the Rationalization of Society*. Polity Press: Cambridge.

Heron R le. 1993. *Globalized Agriculture: Political choice.* Pergamon Press: Oxford.

Hoffman ML. 1970. Moral Development. In Carmichael's Manual of Child Psychology. Volume 2. Mussen PH. (ed). John Wiley: New York. 261-359.

Jackson MC. 2000. *Systems Approaches to Management*. Kluwer Academic/ Plenum Publishers: New York.

Jackson MC. 1991. Systems Methodologies for the Management Sciences. Plenum: New York.

Jackson MC. 1982. The Nature of Soft Systems Thinking: The work of Churchman, Ackoff and Checkland. *Journal of Applied Systems Analysis* **9**: 17-29.

King PM, Kitchener KS. 1994. *Developing Reflective Judgment*. Jossey-Bass: San Fransisco.

Kitchener KS. 1983. Cognition, Meta-cognition, and Epistemic Cognition: A Three Level Model of Cognitive Processing. *Human Development* **26**: 222-232.

Kitchener KS, Fisher KW. 1990. A Skill Approach to the Development of Reflective Thinking. *Contributions to Human Development* **21**: 48-62.

Kohlberg L. 1964. The development of Moral Character and Ideology. In Review of Child Development Research Volume 1. Hoffman ML (ed). Russell Sage Foundation: New York. 383-431

Kohlberg L, Ryncarz RA. 1990. Beyond Justice Reasoning: Moral development and consideration of a seventh stage. In Higher stages of human development: Perspectives on adult growth. Alexander CN, Langer EJ. (eds). Oxford University Press Inc.: New York

Kolb DA. 1984. *Experiential Learning: Experience as the Source of Learning and Development.* Prentice Hall: New Jersey.

Krimsky S. 1995. The Cultural and Symbolic Dimensions of Agricultural Biotechnology In Issues in Agricultural Bioethics. Mepham TB, Tucker GA, Wiseman J. (eds). Nottingham University Press: Nottingham.

Kuhn, T. 1962. *The Structure of Scientific Revolutions.* University of Chicago Press: Chicago.

Kuhn, T. 1972. *The Structure of Scientific Revolutions.* 2nd Expanded Edition. University of Chicago Press: Chicago.

Latour B. 1993. *We Have Never Been Modern*. Katherine Porter (trans.). Harvard University Press: Cambridge, Mass.

Maturana HR, Varela FJ. 1987. *The Tree of Knowledge: The biological roots of human understanding*. Shambhala: Boston.

Mezirow J. 1991. *Transformative Dimensions of Adult Learning*. Jossey Bass: San Fransisco.

Midgley G. 2000. *Systemic Intervention: Philosophy, methodology and practice.*

Kluwer Academic: New York.

Miller A. 1983. The Influences of Personal Biases on Environmental Problem Solving. *Journal of Environmental Management* **17:**133.

Mingers JC. 1980. Towards an Appropriate Social Theory for Applied Systems Thinking. *Journal of Applied Systems Analysis* **7**:41-50.

Norgaard RB. 1994. *Development Betrayed: the end of progress and a coevolutionary revisioning of the future*. Routledge: London.

Orr DW. 1992. *Ecological Literacy: Education and the transition to a postmodern world.* State University of New York Press: New York.

Perkins JH. 1997. *Geopolitics and the Green revolution: Wheat, genes and the cold war*. Oxford University Press. New York.

Perry W. 1970. *Forms of Intellectual and Ethical Development in the College Years.* Holt, Rinehart and Winston: New York.

Piaget J. 1972. Intellectual Evolution from Adolescence to Adulthood. *Human Development* 15: 1-12.

Salner M. 1986. Adult Cognitive and Epistemological Development. *Systems Research* **2**: 225-232.

Sen A. 1981. *Poverty and Famines: An essay on entitlement and deprivation*. Oxford University Press Inc.: New York.

Sen A. 1999. *Development as Freedom.* Anchor Books: New York.

Sen A. 1988. *On Ethics and Economics.* Basil Blackwell: Oxford.

Simon H. 1977. *The New Science of Management Decision*. Prentice-Hall, New York.

Skowlimowski H. 1985. *The Co-operative Mind as a Partner of the Creative Evolution*. Proceedings of the First International Conference on the Mind-Matter Interaction. Universidad Estadual de Campinas, Brazil.

Soros G. 2002. *On Globalization*. Public Affairs: New York.

Thompson PB. 1998. *Agricultural Ethics: Research, teaching and public policy*. Iowa State University Press: Ames.

Treanor P. 2004. *Neoliberalism: Origins, theory, definition*. Internet Publication: http://web.inter.nl.net/users/Paul.Treanor/neoliberalism.html.

Ulrich W. 1983. *Critical Heuristics of Social Planning: A new approach to practical Philosophy*. Haupt: Berne.

Vickers G. 1983. *Human Systems are Different*. Harper and Row: London.

Vygotsky 1978. *Mind in Society: The development of higher mental processes*. Harvard University Press: Cambridge, Mass.

West EJ. 2004. Perry's Legacy: Models of epistemological development. *Journal of Adult Development* **11**: 61- 70.

Wynne B. 1996. May the Sheep Safely Graze? A Reflexive View of the Expert-Lay Knowledge Divide. In Risk, Environment and Modernity: Towards a New Ecology. Lash S, Szerszynski B, Wynne B. (eds). Sage Publications: London.

Yankelovich D. 1991. *Coming to Public Judgment: Making democracy work in a complex world.* Syracuse University Press: Syracuse, NY.