

Transforming Education: Evidential support for a complex systems approach.

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- Goldspink C. 2006, 'Rethinking Educational Reform – A Loosely Coupled and Complex Systems Perspective', forthcoming in Vol 34 No 4 , International Journal of Educational Management, Administration and Leadership. Lincoln UK
- Goldspink, C & Kay R. 2004, Bridging the Micro-Macro Divide: a new basis for social science. Human Relations, Vol 57 (5).
- Goldspink C & Kay R, 2003, Organizations as Self Organizing and Sustaining Systems: A Complex and Autopoietic Systems Perspective, International Journal of General Systems Vol. 32, No 5, pages 459-474.

Transforming Education: Evidential support for a complex systems approach.

Abstract

This paper documents the findings of research into a rare example of successful school based education reform. The reform commenced within the South Australian Department of Education and Children's Services in 1999 and is now ongoing. It drew explicitly on systems thinking in establishing change principles. Subsequent research into 'what worked' reinforced the value of following practices consistent with loosely coupled and complex systems theory. This paper compares the approach adopted in South Australia with the more commonly adopted 'managerialist' or so called 'New Public Management' approaches and elaborates on the relevance of complexity as a base for planning and implementing reform. The paper demonstrates that complex systems ideas have profound implications for the policy underpinning institutional change and provides evidence of their relevance and value in practice.

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Introduction

Over the past two decades the principal ideas influencing approaches to the reform of public administration are *Managerialism* (or the ‘new public management’) and *Public choice theory* (Aucoin 1990; Self 2000). The former is an application of managerial method to public institutions and the latter is an extension of the logic of economic markets to administrative and political exchange (Stretton and Orchard 1994; Udehn 1996). These two sets of ideas provide the primary basis also for the reform of education in OECD countries and beyond; being described by Jones and Kettle as an international phenomenon (2003). Australia and New Zealand have been among the more avid adopters of change informed by this thinking.

Most politically initiated educational reform in the State of South Australia had been consistent with these underpinnings. However, beginning in 1999 the South Australian Department of Education and Children’s services (DECS) introduced an innovation from within its central policy directorate which, while modest in scale, had a bold ambition – the transformation of schooling in South Australia. This reform was strikingly different – being informed by systems thinking and learning theory. A detailed account of the project design and outcomes is beyond the scope of this paper and has been documented elsewhere (See Department of Education and Children's Services 2004; Goldspink 2002; Goldspink 2003).

This paper discusses the theory and principles that guided this reform and research findings into the outcomes. These are compared with the principles and practices of educational reform inspired by the more common ‘managerial’ ideas. The two are demonstrated to be in stark contrast leading to conflicting principles for practice. The paper concludes by outlining a theory base consistent with the findings into what worked in South Australia. This draws on the concept of loosely coupled systems and complex systems theory.

Contrasting two approaches to educational reform

Assumptions underpinning Learning to Learn.

The South Australian school reform initiative is known as ‘Learning to Learn’. The initiative grew out of dissatisfaction with past approaches to reform which did not assist with “The generation of new thinking and understandings about the learning process ... [and] the translation of this knowledge and learning outwards to the system as a whole.” (Foster et al 2000: 5)

This project drew on ‘the family of theories of learning that are grouped under the title of ‘constructivism’¹ and systems theory. Constructivism implied embracing a

¹ This was incorporated into the South Australian Curriculum Standards and Accountability Framework (SACSA) and defined in quite general terms vis “The central thesis of constructivism is that the learner is active in the process of taking in information and building knowledge and understanding...” (SACSA p10). Le Cornu, et al. 2003a and Le Cornu, et al. 2003b provide an account of what this philosophy meant in practice within the context of the initiative.

diversity of perspectives and valuing alternative knowledge bases. This compelled a co-developmental rather than top-down approach to change. It implied that no one knowledge base or position would or could grasp the complexity of the task of education within the diverse communities in which it was enacted. The emphasis was, therefore, on providing an environment in which all parties (administrators, teachers, parents and children) could 'learn their way forward' (Foster 2001). Multiple stimuli that encouraged active experimentation in a context of trust were provided. The intent was to re-engage teachers' intrinsic concern for student learning in order to focus on student and social outcomes of education rather than short term achievement.

The incorporation of systems ideas was initially somewhat eclectic. This eclectic approach was not necessarily a weakness at the inception. Loose use of systems concepts served to focus attention on relationships and connections while being non-prescriptive and avoiding a side-line debate about which approach might be 'best'.

The following key precepts were identified by the project manager as having informed the design of the initiative.

- Transformation rather than incremental improvement was needed;
- Meta learning skills are increasingly important to society and business as a basis for knowledge and should be a focal point for education;
- Increasingly education is expected to be future orientated;
- A catalyst or leader is needed to trigger the development of partnerships between stakeholders as a basis for achieving a change in how learning is approached through schooling;
- Complex problems need complex solutions and these can come from those who are confronting them at a local level;
- A sense of vocation constitutes a motivational resource for teachers in the context of education;
- Learning comes through trust and acceptance of risk;
- Reflection on deeply held worldviews and a questioning of identity, not just administrative change, is needed for sustainable benefit;
- Change and uncertainty are ubiquitous and form the backdrop for transformation;
- Sustainable change would come only through responsibility taken at a local level, not through imposition. (adapted from Foster 2001)

These principles guided the selection of change strategies and, equally importantly, informed the behaviour of the advocates of change.

The strong emphasis on constructivism and its relativist epistemology, combined with the emphasis on human values and qualities and the assumption that transformational change was possible by changing thinking, places this initiative within the Radical Humanist paradigm of Burrell and Morgan (1994).

This paradigm would not normally embrace systems approaches and so it could be argued that there is a contradiction between the constructivist theory informing Learning to Learn and its appeal to systems ideas. However, as complex systems theory is being increasingly applied to the social domain, it is becoming accepted that

this does compel adoption of a relativist epistemology. This position has been argued forcefully by Paul Cilliers (1998; 2000), is evident in an autopoietic understanding of social dynamics (Varela et al. 1992) and supported by recent developments of connectionist models of cognition (Brooks 1991).

As the project progressed there was increased explicit use of complex systems theory to discuss, evaluate and design aspect of the change process. This was not championed by anyone in particular but rather, those advocating change found that they were increasingly drawn to this set of ideas as relevant and helpful in explaining their experience. The author was asked to join the project as a resource to assist with this thinking and as a critical friend to raise questions and challenge from a complexity perspective. The author also has a strong background in public management reform and a longstanding interest in learning theory and practice.

Assumptions underpinning New Public Management

The Learning to Learn project took place within a much longer running reform process within the government sector of the State of South Australia. Past and other concurrent attempts at improving education were informed by the ideas underpinning this wider reform effort. Over the past two decades in many developed countries, including Australia (O'Brein & Down 2002), New Zealand (Tooley 2000), the UK (Simkins 2000) and Canada (Hughes 1999), the dominant thinking behind the reform of public institutions has been that of 'managerialism' or the so called New Public Management (NPM). NPM is an amalgam of private sector management practices and prescriptions derived from institutional economics, including agency and public choice theories. In terms of their philosophical assumptions, and implications for practice these ideas are in stark contrast to those informing Learning to Learn. In a paradigmatic sense, NPM is quintessentially functionalist in Burrell and Morgan's schema. The functionalist paradigm rests on regulatory and objectivist assumptions and is:

...usually committed to a philosophy of social engineering as a basis for social change and emphasises the importance of understanding order, equilibrium and stability...

(Burrell and Morgan 1994: 26).

Here the social world is viewed as comprising concrete entities and relations that can be studied using reductionist approaches in order to identify underlying *cause-effect* relations and derive *laws* governing behaviour. While the form of constructivism adopted by the advocates of Learning to Learn was also realist, the epistemological relativism assumed places it in contrast. As Burrell and Morgan remind us, the radical humanist paradigm and the functionalist paradigm are based on irreconcilably different and incompatible assumptions. We see this incompatibility in the systems theory adopted also.

Burrell and Morgan place most systems theory in the functionalist paradigm. One of the reasons is the common attribution of 'purposefulness' to organisations as systems. They note also that much of systems theory is applied to the search for form and function; rather the processes by which organisations change and new social structures emerge. In other words, systems theorists tend to examine how social systems maintain stability (homeostasis) rather than how they demonstrate self-

renewal and how alternative organisation is generated. These observations demonstrably do not apply to complex systems approaches

True to their functionalist roots, Management methods are seen as value neutral, instrumental/technical approaches for improving the efficiency and effectiveness of organisations (Wilenski 1986; Considine 1990; Fitzsimons 2004). Pollitt (1990: 60) argues, for example, that management represents "...a concentration on the immediate, concrete, controllable things which go on within one's own organisation and an avoidance of entanglement with wider-value questions". This is echoed by Taptiklis (2005: 5), who describes managerialism as obsessed with control, seeing complexity as the enemy. He argues that managerialism "... assumes an artificial non-human world, and then develops models and prescribes solutions only in terms of its own artifice".

Within Government, managerial methods were seen as helpful for achieving a shift from a bureaucratic pre-occupation with *processes* to a focus on *results* (Keating 1990). However, advocates of managerial approaches value task differentiation and place great store in the efficacy of formal command and control mechanisms – a concern with process and method is never far away. Organisational performance is assumed to be a direct product of rational control from above. Under 'managerialism', there is commonly devolution of responsibility to middle managers for budgetary and administrative functions and a change from process conformity to output delivery for accountability. Often, however, a limited range of outputs are privileged – generally those that are readily measured (such as dollars) rather than necessarily those that are most important in a policy sense.

NPM embraces a range of assumptions consistent with neo-classical economic thinking, including ideas promoted under the rubric of 'public choice'. This theory characterises bureaucrats and politicians as self seeking and budget maximising; concerned to act for themselves rather than for citizens (Brennan 1996; Udehn 1996). Applied to education, advocates favour industrial de-powering and tighter accountability for teachers and argue for the creation of educational 'markets'.

Both 'managerialism' and Public Choice have contributed to the push for public agencies to be subjected to 'contestability'—competition with or comparison to similar private agencies as a means to find efficiencies and an additional economics derived theory—Agency theory—has informed thinking in this area. De Laine (1997) suggests that Agency theory '*...derives from the idea that political life can best be represented as a series of contracts between parties...*' From this perspective education is cast as a chain of exchanges mediated by contract between a principal (Government) and agents (i.e. schools, both public and private). This facilitates a separation between the policy aspect of education, ('steering not rowing' - Osborne and Gaebler 1993), and the provision of education services. This focus on instrumental levers and formal aspects of organisation has been argued to have had significant consequences in the human and informal aspects of organisation. In their analysis of reform in New Zealand and Norway, for example, Christensen and Laegreid (2001: 89), argue that NPM has:

... replaced a system based on mutual trust among civil servants on different levels, and between politicians and administrators, with a system which potentially furthers distrust. The main idea of NPM is that if only the external incentives are right, good

governance is guaranteed whatever the character of the individuals. It is however, difficult to construct workable democratic administrative institutions in a civil service where the bureaucrats are driven solely by external incentives and private benefits.

Here then we see two competing approaches to reform in general and educational reform in particular. Each is based on fundamentally contradictory assumptions about the origins of and basis for organisational change and improvement. The debate about which is better has commonly be fought on ideological grounds with little empirical evidence to illuminate it. There is however an accumulating body of research which gives a clear indication as to what works in practice. To this body of research can now be added the experience of Learning to Learn. This has been systematically documented and is still being studied—including by the author—so a reasonable body of evidence is accumulating.

What works?

The Author commenced research into the Learning to Learn initiative in 2001. The aim of the research was to inform policy and program design by identifying what had and had not worked and by theorising about the program. Evidence was collected using interviews, teacher narratives, case studies and the analysis of extant documentation (such as school annual reports and Departmental data). The evidence was initially analysed in a manner consistent with grounded theory (Miller & Marcel, 1999). There is an established history of the use of Grounded Theory in education research (Lyall & Suzanne, 2000) and the approach was compatible with the constructivist ideas that have informed Learning to Learn. It also avoided a tendency to prejudge what might be an appropriate theory base.

The findings from research into Learning to Learn compared to managerialist approaches

The key findings as to the basis for the success of Learning to Learn were as follows. Observations are made under each point about how that finding compares to the assumptions underpinning ‘managerialism’:

1. ***Finding:*** *Learning to Learn aimed to ‘reignite the passion of teachers’. Appealing to teachers and administrators intrinsic motivation was found to be fundamental to what was achieved.* The interview and teacher narrative data made clear that many teachers became excited by the learning orientation of the project and by the values and learning principles which informed it. Many reported being excited about teaching again for the first time in many years. Those re invigorated demonstrated a willingness to self-organise to bring about substantial change in their practice.

Comment: From this finding it is clear that the very assumptions upon which managerialism and public choice is based will interfere with the establishment of a desire to change and a willingness to commit to change by teachers. Teachers are turned off by the utilitarian assumptions and anti-humanistic values intrinsic to NPM even the language associated with it gets in the way. Where administrators operate from an assumption of risk of opportunism, and in response implement extensive and often intrusive accountability measures,

based on the South Australian findings, they consolidate an existing mistrust and cynicism which dampens any enthusiasm teachers may have for self-organisation around issues of concern. Similarly, imposed 'solutions' which cast teachers as 'the problem' will be vigorously resisted.

2. ***Finding:*** *Pursuing change with high levels of flexibility and a learning and risk tolerant approach to accountability lead to rigorous approaches to change and a focus on results.* The focus on learning carries implications of allowance of experimentation, tolerance of mistakes, flexibility and openness to alternative ideas, approaches and means of change. The constructivism and encouragement of a pluralism of ideas reinforced this as did the developmental opportunities offered teachers which were diverse and rich, drawing on a wide range of ideas from leading researchers in education. There was no 'one right way' prescribed from above. The interview and case studies made clear that this was also fundamental to a) gaining commitment, b) allowing learning to proceed within a school based on their distinctive challenges and the motivation and passion of those within it c) finding ways that worked in the local context. The data revealed also that the approach encouraged a high level of personal and institutional commitment and discipline.

Comment: This approach to change is inconsistent with what is normally found under NPM. NPM changes are generally rolled out from the policy centre with a concern for consistency and conformity. There may be consultation but little room for learning by doing, for encountering challenging local conditions and inventing approaches on the basis of local inquiry and discovery. Most significantly, the assumption that loose accountability and risk tolerance will lead to disciplined and focused approaches runs directly counter to the 'malingering' and opportunistic assumptions of institutional economics.

3. ***Finding:*** *Maintaining a high level of congruence to the learning focused principles and values informing the change was vital.* Congruence to the principles of inquiry, empowerment, and learning that informed the project proved essential to the establishment of trust. Provided trust was established both between the school and the policy area and within the school (i.e. between school leaders and teachers), deep commitment to change was often achieved. However, the evidence was that trust was hard-won. Schools reported an initial deep cynicism that those initiating the project would or intended to stay true to the principles they were espousing. The initiators reported being continually tested for congruence to these principles. In several cases this testing persisted over several years. Only when reassured that their commitment would be rewarded did they offer it. Once given, it was often substantial and unrestrained.

Comment: This finding is consistent with contemporary recognition within management theory of the importance of agreement on values and the need for trust. However, much contemporary practice in management is incompatible with what is needed to establish it. In particular, processes of accountability which emphasise tight reporting and monitoring of process and outputs. Managers overly concerned with a need to control will send the wrong signals and close down scope for learning (Paul 1997) and undermine the establishment of a set of professional practices and felt obligation and

responsibility essential to education (Avis 2003). Recalling that with Learning to Learn the necessary level of trust took, in several cases, years to establish, it is apparent that the time needed will seldom be allowed in managerial reforms with their attendant demands for short term tangible results. Allowing considerable scope for independent action also conflicts with economic theories which argue that trust cannot be assumed and hence institutions should be managed on the assumption of risk of opportunism.

4. **Finding:** *A 'non-deficit' approach to reform (i.e. avoiding the assumption that the current system is dysfunctional because of the individuals within it) opened up possibilities for institution wide learning and such learning grew from the local area out..* Many teachers reported being excited by the opportunity to learn and to work to improve school practice. Despite being within an ageing and cynical workforce (Commonwealth 2000), those interviewed identified outcomes including; enjoying teaching again (80%), greater professionalism (70%), Feeling their experience was valued (60%), challenged by different views (80%) and ownership of change (50%) and affirmed (40%). There was little evidence of a sense of threat or blame.

Comment: In government accountability is increasingly interpreted as “a process of assigning blame and punishing wrong-doing” (Canada Treasury Board, n.d). Politicians can readily be tempted into trying to satisfy a public desire to find ‘who is at fault’. The idea that where there is failure there must be negligence is also indicative of the functionalist/managerial assumption that complex systems are intrinsically controllable if only leaders ‘stay on the ball’. This assumption commonly draws managers into an attempt to ‘lock down’ or systematise practices’ (as often seen in contemporary quality management) in the hope that this will avoid error thus preventing the one strategy which can address error in complex systems – learning and flexibility (Stacey 1996; Stacey 2001). Searching for ‘who is at fault’ drives out learning and diminishes capacity building within organisations, most of all, it fosters resistance.

5. **Finding:** *Evaluation pursued as an opportunity for learning rather than to attribute fault or blame, maintained a focus on outcomes and added substantial value to the policy development process, ensuring practice could be improved in complex and unpredictable environments.* The concern of education and with educators is with the wellbeing, both short and long-term, of students and the wider society [see for example Delors, 2000 #69]. These are often challenging and subject to a wide range of influences – both social and economic. It was apparent from our data as well as from earlier studies that teachers resent having to focus on short term (and often politically expedient) outputs at the expense of these wider values linked concerns. When the interests of children and community became the focus for learning, teachers proved willing to engage and to adopt their own evaluation practices. The case studies revealed that some schools had invented elaborate and sophisticated, quantitative and qualitative methods for collecting evidence about how well they were doing. They were likely, however, to comment unfavourably on what they regarded as the ‘busywork’ institutional evaluation frameworks.

6. **Comment:** While the managerial reforms of the 1980s placed a clear emphasis on outcomes, the increased influence of economic approaches and in particular the use of purchaser/provider and contractual links has shifted the focus to outputs-‘tangible intermediate deliverables’ in NPM speak (Finance 1997). Arguably this reintroduced a potential for goal displacement (Bohte and Meier 2000) or working to the measure. It certainly should have if the utility maximising and opportunism assumptions of institutional economics were correct. Significantly, the learning to learn evidence supports what others have found (see for example O’Brein and Down 2002), the output focus and a concern with what was readily measurable was in conflict with teacher’s sense of commitment to student long term interests. Evidence suggests that when confronted with such a conflict teachers passively or actively resist
7. **Finding:** *Within Learning to Learn, tight hierarchical/administrative control was not necessary to achieve a very high level of strategic coherence. Indeed; emergent insights into possibilities for strategic improvement arose where diversity and pluralism of perspective was encouraged and supported.* The project advocated the need to ‘learn our way forward’(Foster 2001) recognising that the challenges needing to be addressed could not be readily identified in advance. The adoption of a ‘best practice’ orientation, with its attendant belief that models drawn from elsewhere, or identified in advance based on reductive analysis can lead to effective change was explicitly rejected. Contracts struck between the policy centre and sites were based on establishing principles and relationships, not specifying outputs or mandating process.

Comment: Such an approach is consistent with Tsoukas (Tsoukas and Chia 2002) that “*Change programs “work” insofar as they are fine-tuned and adjusted by actors in particular contexts—that is, insofar as they are further changed on an ongoing basis*”. This is in direct conflict with managerial assumptions and the emphasis on the need for hierarchies of plans and consistent policies propagated from the centre out or top down and the assumption that the major issues can be identified in advance and accommodated in the plan (Stacey 2000; Stacey 2001; Taplikis 2005). The finding is also consistent with research into what constitute effective institutional responses to ‘wicked’ policy problems. The long term goals of education set out by peak bodies such as UNESCO and indeed by the Australian Government (<http://www.aspa.asn.au/natgoals.htm>) qualify as ‘wicked’ (Conklin 2005) embracing as they do wide aspirations for the long term outcomes for students, economies and societies from investments in education. It is increasingly being realised that conventional tight hierarchical management does not lead to effective responses to such problems (Kernick 2005):

Finding: *Reciprocal obligations based around trust were effective in maintaining a high level of compliance to principles and in protecting and balancing stakeholder interests.* Far from leading to opportunistic behaviour, the change process generated considerable commitment to a felt common purpose. This purpose focused on the interests of children but grew in some sites to embrace wider sections of the school community. There was no evidence of schools fighting for a greater share of resources or opportunity and

a great willingness by teachers and school leaders to put in additional time and to share learning within and across sites.

Comment: This finding can conflict with managerial assumptions about the need for formal structures and mechanisms (rules and material incentives) to maintain compliance and does conflict with economic, and particularly Public Choice advocates assumptions about the likelihood of opportunistic or self-serving behaviour arising in the absence of such rules and incentives.

In short, what the research revealed as the basis for success in South Australia, can be seen to conflict in almost all respects with what has been done where managerial and economic principles have been used as the theoretical base for designing and implementing educational reform.

NPM, as with management theory in general, is somewhat of an eclectic melange of ideas albeit derived from common (functionalist) assumptions. Learning to Learn, to a large degree eschewed this body of theory in favour of an alternative – that of learning and systems theories – in particular complex systems theory. Having found the theory adopted by advocates of NPM wanting in terms of its capacity to provide an effective basis for the design and implementation of effective change in education – do these alternative theories offer a more effective alternative? More importantly can they offer a coherent and internally consistent foundation for such change, or is it the case that they too offer only a fragmented and partial base from which one can draw selectively to justify what is in reality being pursued for different (perhaps ideological) reasons?

Towards an alternative theory base: Educational Organisations as complex systems

In the earlier section of this paper it was argued that complex systems theory was compatible with a constructivist philosophy. In this section this idea will be pursued. A case is put for adopting a theory of organisation which is based in two interlinked theoretical positions. These are a constructivist theory of knowledge and learning – in particular that furnished by the theory of autopoietic systems – and complex systems. These two sets of ideas have been suggested as a basis for an internally consistent theory of sociality and organisation (Goldspink and Kay 2003, Goldspink and Kay 2004). Here this theory is combined with Karl Weick's, proposition that educational systems are best viewed as 'loosely coupled' systems. Paradoxically, under the influence of 'managerialism' and institutional economics, many government and private services are now being delivered less by tightly coupled hierarchies and more by distributed networks. While management theory concentrates on how to make these tractable (generally by tightening the coupling) the ideas presented here may suggest an alternative – a means of better capitalising on the intrinsic benefits of loose coupling. The argument therefore has potentially wider application than just in education.

Loose coupling within education systems has been variously interpreted (Orton and Weick 1990), however, the critical insight is that systems organised loosely do not lend themselves to formal or bureaucratic control, rather they need a different form of management if their distinctive advantages are to be realised. Loose coupling suggests a rich multi-dimensional coupling between the many 'agents' which make up a system but with no single locus of control. Weick expressly identifies such systems as more capable of remaining viable in complex and uncertain environments. Benefits

include, 'persistence', 'buffering', 'adaptability', 'satisfaction' and 'effectiveness'(Orton and Weick 1990: 217). Loose coupling does not require coherence between different parts of the system for it to remain viable.

While loosely coupled systems deal with local challenges well, they imply a slow diffusion of central initiatives. As a consequence, Weick (1982: 675) argues "...*the administrator has to start projects earlier, start more projects, start projects in a greater variety of places, talk more frequently about those projects that have been started, and articulate a general direction in terms of which individual members of the system can make their own improvisations*". Learning to Learn provides an example of this approach in practice, with its emphasis on: learning as the change framework; provision of multiple stimuli at multiple points throughout the system; encouraging active experimentation in a context of trust; maintaining a focus on outcomes and core values as a central target and integration point; tightening and providing richly connected structures around pedagogy and loosening structures of compliance and administration. However, the more we looked at the evidence, the more we questioned how far this perspective could take us.

Who or what is loosely coupled?

For Weick, it is institutions that are loosely coupled. He does not delve too deeply into the mechanisms by which institutions form nor the mechanisms by which they organise into networks.

Managerialists and institutional economists assume that institutions can readily be designed to perform specific functions: that institution forming is a rational process.

In drawing on constructivist theories of knowledge and on complexity theory, the initiators of the Learning to Learn initiative did not accept this assumption and did not act as if it were true.

The appeal of complexity theory was that it directly challenged the functionalist assumptions upon which contemporary management is based (Stacey 1996; Marion 1999; Cilliers 2000; Stacey 2001).

Complex systems can display both high levels of order and disorder. Importantly, order in complex systems is usually a result of micro structuring processes that provide for robust self-organisation. This form of order is not dependent on hierarchical control but is distributed and local in its operation but can lead to macro or system wide stability (or instability!). Importantly, rational control is seen as only one source of order within complex systems (McKelvey 1997).

What this means is that no actor, not the janitor or the CEO, gets to 'choose' the form of 'organisation' in which he/she is just one agent. The pattern, which an observer might call 'the organisation', 'the school', the 'Department of State', is emergent. It is capable of a wide range of dynamics and even though some actors may be able to exert considerable influence on important sub-processes, the consequences of their choices may be manifold and will often lead to unanticipated consequences. Viewed from this perspective, the functionalist assumption of the possibility of command and control is a fantasy.

Implications.

While we are only beginning to explore the degree to which the implications of this theory align with what we commonly observe in organisations some insights applied to education are explored below. Connections are made to some of the most important empirical observations made in the case of Learning to Learn.

Initiating Change – implications for Leadership.

From this theoretical perspective the role of a policy unit within a Department of Education, for example, would need to be thought about quite differently than we generally observe through a functionalist lens. An advocate of a policy change who wants to maximise his/her chance of making a difference will try to locate the patterns that shape the existing dynamics within the system. In the case of education, these will almost certainly spill out beyond 'the Department' or 'the school', to include the wider community. The policy advocate will attempt to use available resources to act as a catalyst and will also position as a provocateur, seeking to amplify those elements which are generating dynamics which can be helpful and disrupt or disturb those judged unhelpful. Note that the judgement about what is 'helpful' or 'unhelpful' and of what is contributing to it, is highly observer dependant and, as it is never possible to really understand 'the system' (as the observer only interacts with his/her successive construction of it), implies the need to 'learn ones way forward' and a great deal of critical self reflection. The advocate needs a well developed capacity to hold many possible interpretations simultaneously and to question the assumptions upon which they are based: to learn epistemically. At this juncture it is perhaps worth reflecting on the selection criteria commonly found for senior managers in contemporary organisations. We are likely to see great value placed on confidence and a clear sense of direction. A level of modesty and circumspection and a capacity to question ones own deepest assumptions are unlikely to feature, but based on the argument being presented here, would seem more what is called for.

Leadership then becomes a process of inviting others to participate in a process of critical inquiry involving a lot of active experimentation. It requires a willingness to acknowledge that 'we don't know how!' As more observers enter the process (as commitment is generated and gained) then ways of maintaining this critical reflection across wider networks becomes a priority for those wanting to advance change. Within Learning to Learn, those in leadership positions frequently reported feeling torn between acting as they felt they were expected to in their formal (functionalist) role– as controllers– or as the supporters of their own and others learning which meant acknowledging that 'they did not know how'. They reported becoming more effective as they managed this personal change.

Finding the points of integration

Accepting that it is not possible to determine specific outcomes implies that beginning with highly specific goals is of little value, as are detailed plans. What is needed is some insight into the underlying dynamics of the system: a sense, even if only tentative, of what keeps it as it is and where there are tensions and points of divergence.

Applied to education, there are many systemic influences which conspire to keep teaching the same. These include the expectations of the wider community and of

teachers themselves about what school 'is' and how it should work. These expectations are often conservative, and are based on how school was experienced by the stakeholders when they were young. These conservative 'forces' have conspired to undermine many central initiatives to change (Sarason 1990).

Another integrating factor in school education is the well documented *intrinsic* concern teachers have for student learning (Dinham & Scott 2000). Teachers resist anything that in their view runs counter to the interests of students. Typically 'what is in the interest of students' will be conservative assumptions about 'how school has in the past and should continue' to operate. What was significant in the case of Learning to Learn was the change triggered at the level of teachers own critical reflections on *their* practice and the induction of a deep questioning and willingness to revisit and rethink what they had traditionally done. Arguably, picking and disrupting this conservative dynamic, and in so doing reframing teachers sense of what was in students interest was the most significant contributor to the change that was achieved. Once this reframing was underway, this intrinsic concern of teachers began to work for the change rather than against it. Importantly it also converged with the interests of other stakeholders.

Initiate Creative disruption

The evidence suggests that it was the introduction of constructivist learning principles which was the most disruptive aspect of the Learning to Learn initiative from the perspective of teaching practice. This may seem surprising as constructivist theories of learning have been around for a long time. In the case of South Australia, the curriculum framework, which had been released some years before the Learning to Learn initiative, was based on constructivist principles. There was evidence, however, that this had been largely ignored or its implications for teaching practice not appreciated by most teachers (Foster 2001). Had the change to constructivism been demanded by central dictate, it would most probably have been resisted (both actively and passively). Learning to Learn approached the introduction of constructivist thinking in an 'invitational way'. There was something about inviting teachers to renew their waning enthusiasm for teaching by learning more about learning, focusing this around constructivism and hence inviting teachers to begin to reflect on their assumptions about knowledge and linking this to their intrinsic concern for children, that worked. The adoption of a constructivist learning framework was, for many, a major shift. It was a shift at the level of epistemological assumptions and implied the need not only to question their day to day teaching practice but in many cases their way of seeing the world. The evidence suggested (Goldspink 2002) another important ingredient in achieving this shift was the establishment of a challenging yet safe environment which genuinely supported and valued teachers own learning. That it was genuine, was communicated most powerfully by the behaviour of those advocating the change and in the invitational stance adopted— in essence teachers reported perceiving a high level of congruence between the espoused principles and the practice. Interestingly this level of congruence also acted as a significant perturbation of the system (teachers reported assuming that the policy advocates actions would be inconsistent with their espoused values and were surprised when it was consistent!).

Meaning changes practice and practice changes meaning

From the perspective of the theoretical lens being adopted here, once whatever kept the system as it was has been disrupted and some new dynamic has started to emerge, change can become auto-catalytic: it can proceed very rapidly but in directions which cannot be anticipated by individual players. The more agents actively reflect on the relationship between the macro outcomes and their own judgements about what is valued, and as they use their personal agency to perturb the system, there is a simultaneous shift in many system parameters and not only will its dynamics change but the range and type of dynamic it is capable of changes also. What is happening can be tracked to some degree by mapping the narratives emerging from those domains (the way those involved attribute meaning to the experiences they are participating in and contributing to). As the underlying coupling and intersection of networks is maintained primarily in and through language, patterns in language provide a useful marker about the unfolding dynamics and points of convergence and divergence within the network. Many of the resulting dynamics will not be expected and will be alternatively construed from the perspective of different observers.

To maintain progress of desired change the cycle of reflection and action needs to continue: a focus on maintaining the learning and generating more active experimentation around a set of (also evolving) principles becomes important. As change accelerates and in unanticipated ways, there may be a loss of stability around short term outputs, so focusing on long term outcomes or orientating principles or values becomes more critical. Paradoxically, as new domains of shared meaning emerge, out-groups may form, this is a valuable process as too much convergence re-stabilises the network – potentially around dynamics which harm what is being sought in terms of outcomes. The focus of ‘managing the change’ becomes a process of maintaining a balance of turbulence and coalescence of pattern, again attempting to converge desired patterns and disturb undesired patterns.

Within the early stages of Learning to Learn, constructivism, while connecting to teachers concern that the focus of change be about children and their learning needs, had little or no felt meaning. As a set of ideas it had limited potential to influence practice. Only relatively few teachers appreciated what the epistemic shift implied. These teachers used the introduction to modify their practice. The evidence shows clearly how this became autocatalytic, inspiring other teachers, eliciting support from leaders and community as the changes were seen to be effective (Goldspink 2002). As a consequence it was possible also to trace the shift in thinking and practice, first within relatively isolated pockets, then within schools and subsequently through networks of schools.

Measure what is valued

Managerialism and economic approaches suggest that performance should be evaluated in terms of tangible results (outputs). However, goal displacement inevitably arises when these are substituted for the desired longer term social and individual benefits that are the focus of policy and the concern of the stakeholders of education. The output approach is based on the assumption that what is needed **and** how to achieve it can be unambiguously identified in advance by competent managers: that the problem is tame rather than wicked. However, where performance (and associated rewards) hang on the achievement of tangibles within specified time-frames, the complex and the challenging will be avoided. This implies that

individuals or groups that are rewarded on the basis of short-term tangible outputs may maximise performance in ways that reduce the systems capacity to deliver against longer-term outcomes. As Lumley notes “...rewarding only quantitative results tends to drive the system back towards the “fabricative” pole and suppress both creativity and organizational learning” (1997: 19). As a result adopting such approaches can erode the longer-term adaptive capacity and hence viability of educational institutions. In contrast to the data driven ‘managerialist’ approach to evaluation common within the wider Department, the Learning to Learn approach focused on collecting rich (qualitative and quantitative) evidence to inform learning towards long-term goals. At the same time a strong emphasis was placed on encouraging and focusing teachers’ intrinsic commitment to student well-being. An environment was co-constructed which was both provocative and supportive. Teachers were provided with access to a wide range of ideas and thinkers in many areas of education, these included specialists in the cognitive sciences, educational administration and pedagogy. There were few mandatory requirements that this be accessed and teachers were invited into exploring different ways of making sense of teaching and learning. Local research was encouraged promoting critical reflection at the local level – often with support from leading academics: teachers felt valued and empowered to inquire and to question. The few mandatory ‘deliverables’ were also orientated to learning. Many teachers stated that being expected to present the story of their own sites learning to other sites at practicums and an annual Expo was the most threatening yet rewarding experience of the change process.

No Trust - no Capacity to Influence (for the better)

Kelly and Allison (1998) argue that high command low trust systems generate self-organisation that works to the detriment of the organisation. They emphasise the need to concentrate on the more informal aspects of organisation to effect self-organisation that is advantageous. This includes facilitating self-reinforcing cycles based on deep commitment, open learning, responsible action and trust. Again we see evidence of this in practice with Learning to Learn, and the research makes clear that this ‘informal’ and ‘high touch’ orientation was central to the success of the project.

There was clear evidence that the aging workforce in South Australia had become fatigued by previous change and was cynical of centrally driven attempts to improve schooling². Many staff are in the latter stage of their career and had little real incentive to change- yet change they did. But they did not do so immediately and only proceeded with caution. The evidence suggests that the critical factor affecting the willingness to engage was the existence of the alignment of values around children’s interests and learning, *and*, after repeated testing for congruence, that this value orientation could be trusted. To clearly identify trust as essential is also to go only part way towards an explanation. Trust is often talked of as important within the management literature-it is however elusive in practice. Significantly the values being espoused by Learning to Learn were at odds with those reflected, not so much in the ‘management speak’ of the wider organisation but certainly in the power focused culture. The achievement of it within the context of Learning to Learn can be partly attributed to the individuals involved in promoting and management the project and their integrity. To focus on this, however, would cast the other stakeholders in too

² A managerial reform being pursued at the same time was vigorously resisted.

passive a role. What is clear is that, at least within education, and despite the recent adoption of the language of learning, the assumptions upon which managerialism rests and the practices to which it gives rise, are all too often in direct contradiction to what is required to open up the possibility of genuine inquiry and learning at the institutional level. In the case of NPM, with its explicit use of Agency theory and other economics derived ideas, the conflict is explicit.

Conclusions

Educational systems demonstrate considerable robustness and resilience in the face of both environmental and intended change. Despite many attempts to reform educational systems to make them more effective and efficient, little change has been realised in over a century. Classical bureaucratic, managerial and economics based approaches to reform have proven to be limited in effect. In part this is attributable to inappropriate assumptions about the nature and origins of order in educational systems.

Empirical insights into ‘what works’ in educational reform derived from the South Australian Learning to Learn project, lends support to the adoption of a complex systems perspective as a basis for the design and implementation of school change.

In contrast to the managerialist approaches currently enjoying wide favour, this approach advocates working with and harnessing the robust self-organisation possible in such systems while also revealing the basis for strategic intervention and change. This includes having those involved find ways to build intrinsic motivation and innovate at a local level to find solutions to wider institutional problems. A key to this is a focus on relationships and the building of congruent behaviour based around trust. Such a theory base is also compatible with recent post-modern influences on, and advances to, our understanding of learning. In this way it is more intrinsically compatible with contemporary learning practices than are either conventional management approaches and/or economic derived theory bases.

Much of the management literature works from the assumption of the need for change to begin from the top. This is argued as a lesson of history but is more likely a truism, i.e. it is true within the organisational environments that result from adoption of this view. Lewin et al (1998: 37) note “...*managers have learned that change does not happen simply because they plan or mandate it*”. This is only too evident in education reform where real change has been identified as difficult to achieve despite significant top down effort (Sarason 1990; Fullan 1994; Spillane 1999; Evans 2001).

If change is to be grown from the inside out, the role of the policy centre in initiating or supporting the diffusion of system wide change is to act as a catalyst and to encourage and support a search for loci of change and to encourage or orchestrate intervention at multiple local points to trigger change— it must do so however with integrity and ethics and in a context of trust. There is a role also to monitor for the inevitable unintended consequences and to use this to refine interventions to maximise the positive and minimise the negative. They may also have a role in collecting rich information about macro outcomes of local action to feed back to local levels to help inform local decisions about what works and why.

Shaw (1997), drawing on a complex systems perspective notes that the emphasis for intervention needs to shift from formal systems to informal and from macro level intervention to micro. This reinforces Weick’s observation and the lessons from

Learning to Learn, that multiple simultaneous interventions at multiple points throughout the system are necessary and effective at influencing change in loosely coupled systems. Importantly these interventions will tap into and influence the deep seams of discourse – those that are important and may not be explicit in orientating what people value and what they act upon. It will bypass or avoid or perhaps disrupt those domains of discourse which integrate behaviour inconsistent with that which is desired. This can only be done if those inventing the interventions are sufficiently located within those domains to understand their subtleties yet can separate themselves from it by inventing and participating in a viable meta-discourse of inquiry into them.

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