Abstract
Leadership development has traditionally encapsulated an individualistic focus in organisations more properly construed as leader rather than leadership development. Over more recent years advances in leadership theory have moved towards seeing leadership from more relational and systemic perspectives that have implications for leadership development practice. This paper builds on this literature in putting forward a model of leadership development drawing upon ideas and concepts from complexity science. Complexity leadership development is suggested to incorporate a focus on four key dimensions that recognise the inter-relatedness and systemicity of leadership in organisations. Here the behaviours of individuals interact with wider organisational processes and context that together are considered to produce overall leadership effects. Four dimensions are put forward in the complexity leadership development model comprising network conditions, (2) shared leadership, (3) organisational learning and (4) manager skills and knowledge. The implications of the model for future research in HRD and challenges for practice in the field are discussed.

Key Words: Leadership Development, Complexity.
1. Introduction

Much of the writing in leadership until relatively recently has been dominated by solo-heroic leadership models typified by style theories of leadership which are increasingly becoming of limited value given the increasing complexity with which organisations are having to contend (Higgs 2003). The term complexity captures the greater levels of uncertainty, ambiguity, inter-dependencies and inter-relatedness that now characterise the environments in which organisations operate. Rapid social, economical, and technological shifts taking place as we enter the next decade are producing even greater complexity resulting in increasing dynamics of instability (Uhl-Bien et al 2007). These conditions now place major constraints on conventional constructs of leadership where the locus of leadership has centred upon how an individual leader exercises interpersonal influence in order to gain the commitment and motivation of followers towards the pursuit of organisational goals.

A leader-centric perspective of leadership has similarly formed the basis of most leadership development models and approaches that have appeared within the HRD literature (eg Conger 1992; Gardner et al 2005; Orvis & Ratwani 2010). Although there have been some recent advances over the past decade in delineating differences in how leader and leadership development might be construed (Day 2001; Drath et al 2008), there have been few attempts to extend the concept of leadership development from a complexity leadership perspective (cf Turnbull James 2011). This paper is an initial attempt at doing so through presenting a conceptual model to guide both theory and practice in complexity leadership development. The paper is structured as follows. First, a brief review of leader and leadership development is presented identifying how these represent differing targets for development, moving from individual to systemic levels. Next, the key elements of a complexity leadership perspective are discussed highlighting significant departures from the way in which the construct of leadership has been perceived in the past. A conceptual model for undertaking complexity leadership development is then put forward incorporating interventions that target both human and social capital in organisations. Finally, considerations of how the model can be used to inform future research are discussed followed by challenges this approach to leadership development poses for HRD practice.

2. Leader and Leadership Development: Contrasting Targets for Development
Over recent years writers have increasingly sought to differentiate between the concepts of leader and leadership development very much mirroring theoretical developments in our understanding of leadership. McCaul & Van Velsor (2004 p2) define leader development as being about “the expansion of a person’s capacity to be effective in leadership roles and processes”. As such it is concerned with the development of an individual’s skills, knowledge and competences associated with formal leader roles. From a HRD perspective, the focus is one of human capital development in organisations. Day (2001) suggested that this individual level focus targets intra-personal competencies and highlights skills such as self-awareness, self-regulation and self-motivation as being central to the development process. More latterly the developmental process by which leader proficiency in these skills evolves has been recognised as involving a deeper-level personal transformation associated with leader identity formation as leaders increasingly become aware of themselves (Day et al 2009; Day & Sin 2011). Research in leader development has therefore concentrated on gaining a better understanding of the formal and informal learning processes that contribute to the development of formal leaders and how organisations might effectively intervene in the process (Day et al 2004; Dragoni et al 2009; Orvis & Ratwani 2010; Reichard & Johnson 2011).

Underpinning this approach however remains the assumption that leadership is essentially a process of interpersonal influence, whereby leaders exert influence over followers to achieve desired goals. As such leader development has very much been shaped by leader-centric theories of leadership ranging from trait through to behavioural category and style perspectives (Northouse 2004). The key critiques of this approach concern the failure to consider how leadership is as much dependent on followers as it is on formal leaders (Yukl, 2002; Higgs, 2003), how differing contexts shape leadership effectiveness and its enactment (Osborn et al 2002), and a failure to study the process of leadership in a more systemic manner (Yukl, 2002; O’Toole et al., 2002). More recently, perspectives on leadership as a relational process (involving both leaders and followers) as exemplified through leader-member exchange (Uhl-Bien 2006) as well as the theory of shared leadership (Hillier et al 2006) have shifted our understanding of leadership away from its traditional individualistic focus to a more collective, social concept. Leadership is the property of relationships, no longer residing in one individual. Instead of human capital the focus in leadership development shifts towards the development of social capital. From this perspective, many writers have identified the importance of inter-personal skill
development for both leaders and followers as being a key focus for leadership development creating the bases for trust and respect (Day 2001; McCallum & O’Connell 2009). Through building social capital, the organisation’s capacity for enacting leadership tasks needed for collective work becomes realised (McCauley & Van Velsor 2004). Hillier et al., (2006) argue that the increasingly complex organisational environments require effective team working and this provides the underpinning for a shared model of leadership associated with the concerted actions of multiple players rather than the behaviour of one individual (Gronn, 2002). Leadership development is thus influenced by notions of leadership as a more distributed, fluid construct (Yukl, 2002; Hillier et al., 2006). Here then, leadership is perceived as a function of social resources embedded in relationships. This has resulted in typical definitions of leadership development as being about “expanding the collective capacity of organizational members to engage effectively in leadership roles and processes” (McCauley et al 1998).

Although important, such definitions of leadership development have yet to expand sufficiently to accommodate a much wider systemic perspective on the nature of leadership that recognises leadership as an emergent possibility within the social system where the interaction of individuals within the wider system become the central focus. The increasing complexity facing organisations requires us to consider leadership as embedded not merely in sets of interpersonal relationships, but more widely as constituting an array of interacting organisational processes that facilitate intelligent and innovative organisational adaptation.

3. A Complexity Leadership Perspective

Although a complexity perspective of leadership recognises a role for human relations or personal influence models, this is only as part of a much broader set of leadership processes associated with managing dynamic systems and the interconnectivity within networks (Marion & Uhl-Bien 2001). Complexity leadership draws upon a number of insights from complexity science in order to frame leadership as a property of a social system. In this sense it considers the concept of leadership from a relational perspective (Uhl-Bien 2006), but importantly extends it further in connecting leadership processes specifically with a system capacity for adapting to change, dealing with ambiguities and responding more effectively to complex problems. Complexity leadership thus enables an organisation to deal more successfully with dynamic environments. Processes and capabilities that result in innovation and adaptability are thus the primary focus for understanding
leadership. Leadership is therefore defined in its broadest sense as those structures, processes and practices that “makes things happen” (Huxham & Vangen 2005) in order to cope with greater uncertainty.

Complexity leadership begins with a number of important assumptions about the nature of reality within complex situations or environments. The first of these recognises open systems such as work organisations as inherently too dynamic and unpredictable to be defined by simple models. It therefore challenges the value of reductionist approaches that believe leadership and its impact within complex systems can be captured by simple and linear, cause-effect relationships (Prigogine 1997). The focus is therefore on how leadership might bring about conditions that enable or facilitate organisational effectiveness, in contrast to determining it. The second assumption is that organisations are seen as complex adaptive systems (CAS) that cannot be understood by simply breaking down its constituent components, since the interactions between the system and its environment gives rise to unforeseen and unpredictable outcomes and behaviours. However, a key feature of CAS is that order emerges naturally through many iterations or cycles of random interactions between agents operating within the system, who both act on and are acted on by the structures in which they are embedded (Cilliers 2001). The many interdependent agents present within the system who interact with each other and influence each other, are able to generate novel behaviour for the system. It is important to recognise that agents in the system also include aspects such as ideas and perspectives that themselves can be thought to have meaning and identities. In terms of complexity leadership, the focus is on trying to capitalise on these interactive dynamics and fostering the interactive conditions through which productive outcomes become more rather than less likely.

A basic unit within complex adaptive systems are the notions of ensembles, which refers to sets of individuals and workgroups possessing shared inter-relationships and interests. A further unit is that of aggregates, which refers to the emergent structures that arise when ensembles interact within the social system connected to innovation. When ensembles interact, they are able to engage in behaviours and activities that can lead to reaching common understandings from which self-generative behaviours arise, based around problem-solving and creativity (Marion & Uhl-Bien 2001). The role of leadership here then, is to facilitate and capitalize on these random interactions of aggregates, and create the conditions that promote bottom-up behaviours from which human and social capital give rise to distributed intelligent activity, a process called autocatalysis (Luke
Leadership then is an emergent, interactive dynamic that emerges from the interactions in complex adaptive systems and through which new learning and problem-solving is the outcome (Lichtenstein & Plowman 2009). A key focus in complexity leadership development is therefore seeking to influence the contexts and processes that give rise to these network dynamics. Uhl-Bien et al, (2007) describe these characteristics of contexts as being the networks of interaction and interdependent relationships as well as the conflicting constraints and tensions in the network that are able to generate adaptive behaviours and problem solving.

4. Complexity Leadership Development

In beginning to develop a model to underpin complexity leadership development we must first ask what are the ultimate goals of leadership development here. Clarke (in press), has recently argued the need for a level of analysis perspective in considering how to evaluate leadership training and development. In that evaluation model, the goals for leadership development were considered to be about bringing about more effective, self-sustaining learning networks. Whilst individual leaders are seen as important and requiring a particular set of skills, leadership development also involves shaping the context particularly structures and cultures. Complexity leadership development is therefore concerned with building and sustaining organisational social capital.

It is proposed here that complexity leadership development suggests a needs to focus on four key areas in order to optimize an organisational system’s capacity for autocatalysis, or its adaptive capability arising through distributed intelligence. These are (1) Network Conditions, (2) Shared Leadership, (3) Organisational learning and (4) Manager skills and knowledge (Figure 1).

4.1 Network Conditions: Enhancing the adaptive capacity of an organisational system to respond to complexity requires a focus on the network conditions in which an organisation is situated. A major condition in order for collaboration to occur between agents in the project in order to generate novel behaviours and responses, is that they must be able to interact both with the environment and with each other with great frequency and at very high levels. The formal and informal structural connections between organisational members and partners combined with formal and informal processes within the organisation such as communication patterns and mechanisms for knowledge sharing, represent leadership catalysts that enable emergent innovation (Uhl-Bien et
In relation to structural catalysts, a number of studies have identified the density of team and organisational networks to be associated with commitment and performance (Balkundi & Harrison 2006).

Organisational members possess differing expertise, and it is essential that information is able to be effectively and quickly distributed and exchanged among members, in order for synergies from the interactions between information and expertise to be achieved (Ensley et al., 2006). From a complexity perspective, new knowledge and learning arises through the interaction of system members who coming together, are empowered to identify problems and resolve tensions in the system (Kauffman, 1993) which is an important consideration for organizational learning (Chiva et al 2010; Hannah & Lester 2009).

In addition to network conditions influencing interaction, a further condition of tension has been identified that promotes adaptive problem solving through motivating interactional dynamics (Uhl-Bien et al 2007). Tension reflects the notion that organisational members and stakeholders will possess differing perceptions of a problem, needs, and at times incongruent outcomes that together create a force for action. It is seen as a creative impetus that facilitates information exchange and adaptation. Network processes that promote the positive airing of differences and opposing perspectives as well as support the positive resolution of conflict are thus key skills to enabling self-organization and problem solving among the network’s agents. This suggests that leadership development should include a range of specific organization development and change interventions. These include large-system OD efforts for building social capital such as search conferences, as well as interventions aimed at changing opportunities for social connectivity (Clarke, 2005).

4.2 Shared Leadership: Complexity leadership development recognises a differing pattern of interdependence between organizational actors which pose challenges for understanding complex problems and coordinating responsive actions within networks (Uhl-Bien et al., 2007). Shared leadership dispenses with the idea of followers, maximizing the contributions many more individuals can make to solving difficult problems. This necessitates creating the conditions under which these individuals can “lead” problem-solving whatever the context (Gronn, 2002; Spillane, 2006). In this sense, leadership needs to be distributed throughout organizational networks in order to capitalise on the intelligence that is available. Through the effective use of this intelligence shared knowledge can be created (Agranoff, 2007). This recognises that individuals can pass in and out of leadership roles depending upon tasks and challenges. It is the concerted action arising when an
individual adopts such a role that makes leadership in this sense shared (Feyerherm, 1994). Gronn (2002) has suggested that distributed leadership is realised through ‘conjoint agency’. This refers to those involved synchronising their actions in order to achieve synergy which is brought to bear in problem resolution. This occurs when individuals engage in concertive action that comes about through either (1) spontaneous collaboration, (2) intuitive working relationships or (3) formal structures (or institutional practices eg project teams, working parties). Each of these contributes towards enabling “boundary experiences”, which are the loci for creating shared meaning and exploring different perspectives and important conditions for collaboration (Feldman et al., 2006; Schneider, 2009). From a complexity perspective too, shared leadership is seen as central to differing organizational units spontaneously coming together, interacting and generating new knowledge and mutual learning (Kauffman, 1995; Luke, 1998).

4.3 Organizational learning: Meaning-making processes such as sensemaking are identified as key to enable cognitive social capital. Such processes are widely recognised as elements associated with organizational learning (Ingram, 2002). A key characteristic of organizational learning is that this learning is experiential which then becomes stored and available in explicit and tacit routines, rules and procedures (Zhou, 1993), often referred to as organizational memories (Walsh and Ungson, 1991). Acting on this information is a social process that requires people to make sense of information, generate new meaning and co-create new understanding and knowledge. A systemic approach to leadership training and development at the community level would incorporate HRD interventions designed to bring about organizational learning.

4.4 Manager Skills and Knowledge: A complexity perspective of leadership in projects does not diminish the need for formal leadership roles, particularly those assigned to a manager. However it does require the leadership role and functions to be thought of differently to that which has traditionally been the case. Rather than simply being about interpersonal influence, the manager’s role is instead one of facilitating the conditions for spontaneous and emergent leadership to come about. Or autocatalysis. Knowledge and skills in seven major areas are considered important here.

4.4.1. Supporting Autocatalysis: This involves organising the work environment to facilitate interactions among ensembles. Leaders can focus on job design features such as enhancing delegation, empowerment and offering greater autonomy to team members, as well as providing resources that maximise network building (such as
facilitating inter-organisational reviews). Another key aspect here is providing team members with knowledge and skills to manage and resolve conflict, thus maximising the success for interacting aggregates to reach common understandings and accommodations. The structuring and maintenance actions and behaviours the manager undertakes that will influence team dynamics and processes to support interdependence and interaction are therefore significant (Friedrich et al 2009).

4.4.2. Supporting shared leadership: The manager role needs to be one of coordinating and coaching rather than controlling. It is through these functions that spontaneous, self-organising communities are then likely to emerge. Managers need to focus on building social capital and enhancing social exchange (Graen & Uhl-Bien 1995) between members in order to maximise adaptive behaviours and innovation. Here relational leader behaviours are seen as important, however their role is less concerned with motivating team members as opposed to facilitating interaction between system members and cultivating a climate conducive to the formation of aggregates.

4.4.3. Developing the System’s Network: Complexity leadership requires leaders to develop their skills in effectively managing and developing networks (Gnyawali & Madhavan 2001). This involves enriching established connections, and developing new connections within the network(s) in which they are embedded (Regine & Lewin 2000). A manager therefore needs to encourage increased contact and interactions between team members and help to develop shared expectations for collaboration (Taggar & Ellis 2007).

4.4.4. Supporting shared meaning making: Although complexity leadership recognises that social systems are self-organising and that creative problem solving will emerge in favourable network conditions, the need to keep the system developing on the right track is important. A key element here is the manager engaging in sensegiving with team members in order to promote shared understandings and serve as a basis for resolving tension within the network (Foldy et al, 2008). Managers need to work with stakeholders to develop a shared vision that helps to frame the context for network ensembles engaging in generating creative solutions to problems. Here, there is a need for managers to think in terms of systems and importantly how subsystems interconnect within their wider environments (Senge et al 2008).

4.4.5. Identifying barriers to information flows: Managers also need to examine impediments to information entry and distribution within the project network, and look to counteracting barriers to knowledge exchange.
Members with access to greater amounts of information within a project are likely to possess greater network centrality, which has been found to be associated with leader emergence (Mehra et al 2006). It is through the distribution and exchange of information in a network combined with knowledge of where expertise lies, that is integral to shared leadership emerging (Friedrich et al 2009).

4.4.6. Fostering the positive value of tension: Uhl-Bien et al (2007) suggest complex leaders should foster adaptive tension within the system to facilitate interactive dynamics that are the basis by which ensembles emerge. This requires managers to provide structures and processes that offer opportunities for surfaced conflicting perspectives, needs and goals among team members. It necessitates creating a team climate that values divergent views and supports ensembles through providing them with the skills to resolve conflicts and differences.

4.4.7. Building social capital: The importance of social capital in promoting knowledge transfer (Levin & Cross 2004) places a primacy on manager skills in building and developing social capital within the network. Cognitive social capital is developed through developing shared systems of meaning and can be supported through managers engaging in behaviours that support shared meaning making (Tsai 2000). Relational social capital by contrast is built through reciprocal obligations and social exchanges that bring about trust (Morse 2010). This emphasises the manager’s relational skills and behaviours that enhance social ties rather than about motivating project team members.

5. Discussion

Leadership development has primarily focused on leaders whilst neglecting the dynamic systems comprising leadership in its wider sense (Osborn et al 2002; Uhl-Bien et al 2007) resulting in a rather limited and narrow range of approaches and interventions that have constituted leadership development. Previous research in the literature suggests leadership development can have positive effects, although the results have been more equivocal when seeking to evaluate at the organizational level and beyond (Avolio et al 2009). Complexity and systems approaches to leadership would suggest that linear chains of causality are increasingly difficult to demonstrate for leadership development interventions (Marion & Uhl Bien 2001). Over recent years, a growing body of the literature has criticised the study of leadership as reductionist and deterministic ignoring the interactive dynamics that are a natural part of social systems (Regine & Lewin 2000). This has resulted in calls
to re-orientate our understanding of leadership away from thinking it as a process that determines organizational effectiveness, towards one that enables organizational effectiveness (Marion & Uhl-Bien 2001). Such an approach necessitates a focus in leadership development that at higher levels of analysis may require examining best guess conditions likely to bring about outcomes as opposed to outcomes per se.

Complexity leadership thus offers a more comprehensive theory for understanding how leader behaviours interact within a wider organisational environment to respond to complexity and generate innovation that solo-heroic leader perspective fails in any way to achieve and as such should offer us a new framework for guiding leadership development. Although empirical research on complexity leadership development remains in its infancy, there are a number of studies that have demonstrated the benefits of adopting a complexity perspective primarily in the healthcare, public sector collaboration arenas (Attwood et al 2003; Ovretveit 2005; Umble et al 2005). Here leadership is seen as important as far as it acts as a catalyst for building networks which are the structural components of complex adaptive systems able to generate novel behaviour. There is also evidence that the space agency, NASA is now adopting a complexity perspective on leadership in identifying new sets of competences and leadership behaviours for its technical experts working on projects (Morris 2010). In their leadership development model, knowledge and skills in systems thinking, political expertise, communication and strategic alignment are brought together to form an overall framework in order for project managers to manage increasing complexity.

Future Research & Practical Implications

The notion of complexity leadership suggests a radical shift in the focus of research on leadership development based around the four key areas suggested here as supporting autocatalysis. In relation to network conditions, we need to identify how particular acts of organization can foster adaptive capacities within the system. Leadership arises through a pattern of interactions between team members in organisations and the structural conditions in which they act. Studies which focus on the nature of inter-relationships within the organisation how these are influenced and constrained by team organization and processes, and whether these lead to adaptive problem-solving will provide insights into the interactive dynamics by which complexity leadership emerges. Studies of organisational networks can focus on various indices of interconnectivity such as the level of collaboration and coordination between team members, the level of trust within the team and the
patterns of formal and informal communication through which ensembles can emerge, in response to changing circumstances. How particular structural arrangements such as frequency and patterns of communication, the use and design of agreements, as well as how knowledge management procedures interact in such a way as to influence the emergence of ensembles, will help us to identify how patterns of alignment between structural conditions support emergent leadership.

As well as a focus on structural conditions, the network will also be influenced by cultural factors that influence knowledge sharing, including factors such as norms for dealing with conflict that are likely to affect the positive effects of creative tension, that is the motivational force for adaptive behaviours. Research which attempts to capture the temporal changes that occur in the adaptive dynamics within a team, and how these are then influenced in response to changing organisational network conditions will reveal data about the type of organisational contexts that support complexity leadership development.

Shared or distributed leadership is seen as a key condition within a complexity perspective and future research needs to examine the internal and external factors through which this may be supported in organisations. As yet, we know little about the dynamics of role performance relating to team members adopting leadership roles. These multiple meanings of leadership are likely to act as cultural influences with may either impede or support conjoint agency, the self-generative behaviours that are needed to respond to ambiguity and complexity. Research should capture these social constructions of leadership held by team members and examine how these interact with team structural conditions to identify when shared leadership may be more likely to develop.

The formal leader’s role in enabling an organisation to respond more effectively as a complex adaptive system, requires new research that adopts a different focus on manager skills and behaviours compared to that which has dominated leader development in the past. Some of these behaviours such as relational skills remain the same. However the focus of studies needs to examine how these are associated with building social capital and fostering social exchanges within a network, rather than their role in motivating followers. Similarly participative and empowering behaviours need to be studied in terms of their influence on supporting team cohesion and the emergence of shared leadership. Other research should focus on how a manager undertakes
network building and enhancing connectivity within networks and how this may support the emergence of ensembles capable of innovation.

Finally although this paper is an initial attempt at developing a model for complexity leadership development to guide future HRD research and practice in this area, both the model and this perspective on leadership development does represent significant challenges for the field of HRD. In terms of research there are 3 major issues with which to contend. The first concerns criticisms of the appropriateness of applying complexity science ideas drawn from the physical and biological sciences to human social systems (Cilliers 2001; Goldstein et al 2010). Many argue that complexity ideas may not offer organisational science much beyond that of a metaphor for generating potential insights into learning and adaptation (Burnes 2005). In particular ignoring how politics and emotions are instrumental in driving and interpreting human behaviour (Houchin & MacLean 2005). A problem here concerns the lack of concrete organisational case studies of how complexity theory has been successfully applied within HRD contexts. Although there have been a few studies that have helped to explain and better understand organisational change, these have offered only partial insights (Brown & Eisenhardt 1997; Houchin & MacLean 2005; Pascale 1999; Shaw 1997). Nevertheless, there are a few studies that illustrate the use of complexity concepts as interventions in change programmes designed to improve connectivity and feedback which do suggest positive results (Stacey 1996; Shaw 1997; Griffin et al 1998; Seel 2000). As a counterbalance to this though, long term case study research by Houchin & MacLean (2005) suggested that rather than promote innovation, disequilibrium actually brought about a return to a previous stable state as a result of defensive routines and anxiety shown by organisational members. A problem here may lie in that the data that is generated from research is so highly contextualised that it may have far more limited generalizability than typically generated within HRD research. This may be judged to be of limited value for HRD practitioners who through organisational constraints, increasingly look to best practice, formulaic solutions to meet immediate leadership development needs. A second problem is very much linked to this. Complexity leadership development relies heavily on the notion of a non-linear, sudden coming together of interdependent agents in the system to solve problems in a creative way. This occurs through appropriately structured networks rather than by centrally coordinated groups or teams (Uh-Bien et al 2007). As yet our understanding of what constitutes an appropriately structured network is very much in its infancy. Arguably
although some degree of order is eventually expected arising from random iterations of agents coming together, the inability to specify when this might occur or might be expected poses challenges within organisations that are heavily influenced by short term goal horizons.

There are also as yet unknown feasibility implications for HRD practice. Although tension is seen as a facilitative process within the dynamics of a complex adaptive system it may require levels of empowerment and individual competences in conflict resolution and negotiation that exceed the limits of many members of the workforce or at least will pose an immense burden on the HR development function to support. Beeson & Davies (2000) argue that this will require a fundamental shift in the role of management rejecting command and control style management. HRD practitioners will need to encourage experimentation, divergent views and rethink the nature of hierarchy and control (Morgan 1997). This level of freedom and autonomy may prove to destabilizing for organisations. The notion of rationalising control through detailed attention to planning and organisation also runs deep within the management psyche such that offering deterministic development solutions is hard for both managers and HRD professionals alike to resist. At the same time, we might find that the bottom up emergence of problem solving and creative behaviour through autocatalysis derives from such a high degree of informality within the system that the use of ordered leadership development interventions may well constrain or suppress the adaptive capacity such that the effects create negative feedback.

Clearly all these questions represent significant challenges for both HRD research and practice. In terms of research we may need to adopt an approach that recognises the strength of complexity leadership development theory in terms of its explanatory rather than predictive power. What seems clear is that research will need to elevate long term case study qualitative research methods over quantitative research approaches to begin to get some answers to these questions. This itself may also prove difficult and introduce new tensions within the field where vigorous debate already exists over the actual purpose and boundaries of HRD.

6. Conclusions

Organisations are having to deal with environments of increasing uncertainty and complexity that place significant constraints on the effectiveness of traditional solo heroic models of leadership. Relational and systemic perspectives of leadership are better placed to enable organisations to draw upon leadership capacity but require us to develop new models of leadership development. An initial model of complexity leadership
development is posited here to facilitate distributed intelligence supporting organisational adaptation and innovation. The model captures the systemic nature of leadership through a focus on key domains comprising network conditions, organisational learning, shared leadership and manager skills and knowledge that together support the process of autocatalysis, argued here as central in order for organisations to deal with increasing complexity. However a shift towards complexity leadership development represents a number of significant challenges for both research and practice in HRD which will play a role in shaping the field over the coming decades.
References


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Figure 1: A model of Complexity Leadership Development