

Appreciating Assets: Educational Technology Leadership and the Generation of Social Capital

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Abstract

In the information age, Educational Technologists exist in complex, codependent organizations where the information age is demanding changes to our theory and praxis (Reigeluth, 2001). In this paper, the author argues that advanced leadership theory and practice can be used to characterize and design educational technology R&D, along with praxis, to account for the relatively incredible potential of this field to add to the social capital of our institutions, states and nations. First, the paper presents the need for specialized educational technology leadership epistemology. Next, the macro concept of social capital is presented as a model for describing high level contributions from the field, focusing on identifying key elements educational technology leaders need to understand. Finally, high capacity network characteristics and examples from research are presented to inform ET leaders about what it takes to create and sustain the necessary high capacity leadership network in the information age.

Introduction: A Need For Leadership Knowledge in the Educational Technology Field

Traditionally, the assets of a commercial organization were measured in terms of plant and property as hard assets that were managed as relatively stable, reasonably predictable commodities. The most highly valued companies were the ones that kept production turn-around time to a minimum, balanced stock and sales, and got the best return on financial reserves to provide a prudent mixture of debt and equity for the future. In the new “information age” or “knowledge” economy, the most highly prized companies are the ones that manage intangible assets, such as an ability to generate value, to create and maintain social and intellectual capital for example, rather than to only account for hard assets (Kelly, 2004; Fullan, 2000).

This newer commercial paradigm has arguably not yet affected today’s education institutions – but it is a widespread condition in industry (Senge, 2000). Because schooling is a society sponsored activity, our intangible asset leadership is, indirectly, becoming prevalent and important as a leadership example across education and industry training sectors (Bennis et al, 2003; Helliwell, 2002; Bolman & Deal, 2000). Educational technologists work in both industry and schooling. Are we prepared, in ET theory and in practice, to answer to this critique from an educational technology (ET) field perspective? A common premise behind the government (grant offering) policy thinking may be important: If public and private organizations can not organize themselves to create appreciating (positive) social capital, the projects completed may have less value to society. Are we, as educational technology leaders, knowledgeable and prepared for these changing conditions? It is one thing to be a good instructional designer or developer – it is another to understand the impact of the projects we lead in institutions, partnerships, governments and society. This author posits that educational technologists have a tremendous contribution to offer in terms of social capital creation (appreciation), and that we need to learn new the ways of modeling and managing our ET work within a this larger policy sphere.

Government and industry view education as a significant potential contributor to social capital generation (Woolcock and Narayan, 2000), so educational technologists are directly concerned. This is not only because we practice in both industry and education sectors, but also because we are often responsible for large, expensive public projects that involve a lot of human and social capital. It is possible that under these conditions that without significant change, our field “could be relegated to its backwaters”, and that inertia could influence whether we as individuals are successful in our careers or find ourselves progressively less effective – much as the old tightly bureaucratic firms can no longer handle information markets and much change (Fullan, 2000). ET senior scholar Charles Reigeluth (2001) lists several organizational factors for educational technologists to consider as we adapt. As this paper will demonstrate, the macro concepts of social capital and networked organizations make reasonable new models for understanding and informing educational technology leadership to include finite characteristics such as autonomy accountability, cooperative relationship, networking and process oriented approaches necessary for the organization of the future (Dickson et al, 2003; Reigeluth, 2001). But it is not enough to know the conditions and constraints organizations offer us today – we must know more about how to lead educational technology both as a field, and in practice, in our increasingly interdependent

and partnered education, government and corporate settings (LaGrange, 2004; Hargreaves, 2001; Wheatley, 2000).

In this brief paper the author introduces the imperative for educational technology leaders to consider social and intellectual capital as macro constructs in our leadership, along with definitions of the terms. The important concepts of networks and network leadership are explored, with some examples of high, medium and low capacity technology leadership networks offered from recent research findings. The paper concludes with an argument to place educational technology in the 'dead center' of the recent trend to make social science matter today in high policy circles (Judge, 2004). A summary of the organization and structural characteristics inherent in high capacity social capital generating networks is then offered.

Social Capital: A Macro Level Concept for ET Leadership Today

The late American sociologist, James Coleman (1988) argued that social capital consists of those aspects of social structures and systems that facilitate the actions of actors within a structure. As such, social capital can be used as an important model allowing an aggregate measure or descriptor of complex systems of educational leaders who work together via network structures to improve education (Kelly, 2004). The concept offers an encompassing description of agencies, governments or entire sectors because the unit of study can be approached at either the micro (individual), meso (institutional) or macro (regional, global, economic) levels (Hall, 1994). Social Capital is a macro concept that can be defined in two ways. First, by its structural components (as networks of interacting individuals or organizations) and second by its cultural components (Bourdieu, 1986; Judge, 2004). The cultural components of social capital have long been the focus of social science work on social networks, concentrating on actor (leader) obligations and expectations, trust, information potential, norms and effective sanctions, authority relations, and appropriate social organizations. This kind of social capital cultural research is heavily dependent on actor contact time and other measures using social network theory – an intuitively pleasing idea which slipped into a bit of heuristic confusion in the 1990s (Rhodes, 1996).

Describing social capital as structural networks of people organizing their work, Bourdieu (1986) classified this kind of capital as an asset found in networks where three types of social capital are known to exist in pseudo-institutional environments. Such network types are: bonding (within homogeneous groups), bridging (networks where actor relations cut across diverse social cleavages horizontally) and linking networks (where ties are formed between different strata of status, influence or wealth). Describing intangible assets in this way, a process, involves studying flows of information and the types of relationships existent in both institutional and political terms. Recent policy network scholars have developed a set of network characteristics that allow us a model and describe the types of relations among many kinds of entities a wide array of contexts (Judge, 2004; Bourdieu, 1986). Strong relational links in these networks generally mean a highly capable system for generating social capital, but weaker links and bonds (like those used by job seeking individuals) can also mean much more social capital for individuals who must work across groups and fields, for example (Granovetter, 1978), so the network concept is not quite as intuitive as it sounds.

By applying more advanced political science derived constructs of policy networks to describe the relational (structural) networks in organizations (and between them), the process of interest organization (what matters to who, and how they respond to pressing issues within influence networks) can be studied to create an encompassing and discriminating method for understanding social networks because structures with specific taxonomies, capacities and autonomies can be identified by how folks organize their interests (Atkinson, 1996; Coleman, 1998). In 2003, Kowch modified policy network theory – an advancement on earlier social network theory to include influence and power. This extension allows the description of structural social capital elements (networks) more precisely at the institutional level. Kowch studied educational technology leadership (influence networks) across states, governments and large institutions to identify network philosophical, leadership style and educational technology actor ontologies as important sets of variables policy leadership systems that emerged across several universities, for example.

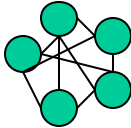
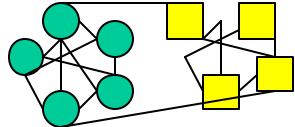
In his book "Bowling Alone", Harvard's Robert Putnam revealed a national study describing and explaining some of the reasons for a steady decline of social capital in America over the last 50 years, in social capital in America (Putnam, 2000). He measured social capital via social network analysis, including a deep analyses of volunteerism in America. He defined a sharp, continuing decline in American's participation in professional organizations and public institutions – a depreciation in social capital. Among his findings are revelations that education (capital) systems require more funding to increase education system performance, and that more children (learners) must be included in education networks. From these and similar findings arise powerful implications and models for the leadership of any educational technology R&D in both public and

private settings.

Educational technologists today are working more frequently within and across the domains of utilization, design, development, management theory and practice simultaneously in complex institutional settings and partnerships. These partnerships are often formed with with the state government or local governments, where a codependence often exists between the institutions working together on ET projects. It seems then, that a structural or network approach to understanding ET leadership could be very helpful as a way of interpreting and designing information age ET social capital generating projects in a time of great change and organizational/political complexity (Reigeluth, 2001), especially when codependent relations are essential to our ever increasing project complexity and size, and when the type and kind of network (bridging, bonding, linking) may need to be carefully designed and used to measure our successful ET contribution to social capital. This is an important statement when governments are generating policy to fund and to promote primarily high social capital education endeavors (Woolcock, 2000).

Effective leadership networks create a high social capital generating capacity. For example, across-school division improvements or pan-institutional corporate training through ET work is common practice for us in the design and development we do in the field. Can we account for this value-added intangible asset? Distance learning has increased our need for financial capital while at the same time it is easing us from geographically constrained relations – a factor that is still a condition constraining most fields in education . Think of this kind of ET asset or capital from a government granting agency perspective. Independent of the product of our usual project processes, can educational technologists claim increased social capital generation because of the processes we use to get things done? I think we can. This is because we link all sorts of experts and people in meaningful ways, across social strata, diverse social cleavages, institutions and governments – consistently. If a granting agency is considering the linking, bridging and bonding characters of a project as it creates links between and across organizations or entities, we among most educators create, design, maintain and yes, provide leadership for such work consistently. Compared to a project in counseling psychology for example, we generate far more social capital, by definition. We rarely document that contribution in organizational and social contexts.

As educational technology leaders, there exists little evidence that we have found a way to describe the benefit (appreciation), in terms of our organizations, of these intangible systems when they work. Yet there is little doubt that these systems add to the capital of the organization, state or nation (Kowch, 2003). If we can describe these network processes, we should also move to expand theory so that we can design and be accountable for the social capital generated by such capital generating networks. Figure 1 demonstrates the three types of (structural) social capital developed by networks.

Type of Social Capital (Network) found in institutional arrangements (Kowch after Bourdieu, 2003)	
<p>Bonding</p> <ul style="list-style-type: none"> – Relations within homogeneous groups – Strong ties mean stronger capital (Putnam, 1998, Woolcock, 2004) – Example: Teachers Associations 	
<p>Bridging</p> <ul style="list-style-type: none"> – Relations cut across diverse social cleavages <ul style="list-style-type: none"> • Horizontally - key to exchanging new info <ul style="list-style-type: none"> – Useful for information diffusion • Weak ties mean low capital, and be an advantage for innovation / or organizational change (capacity) – Example: A distance education project consortia, led by a university organized to design and deliver technology leadership education to both school principals and home school parents in 	

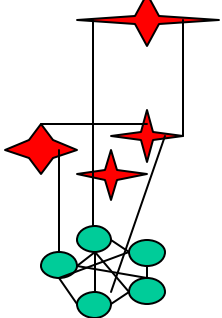
<p>the Australian outback.</p>	
<p>Linking</p> <ul style="list-style-type: none"> - Ties between different strata of wealth and status (Woolcock, 2003) <ul style="list-style-type: none"> • Vertically - key to linking formal institutions - Ties between different strata of influence (Kowch, 2003). - Example: Educational Technology Leaders designing, creating and implementing state level distributed education procedures / policy, and expanding the partnership to include European states, universities and schools to do the same thing. - Example: ET leaders in multinational corporations leading consortia development of new satellite based education programs across the globe in several countries. 	

Figure 1: Types of social capital with Educational Technology Field examples

Leading Educational Technology via Network Leadership: A Meso Level Concept

Developing and leading in the disaggregated or neo-institutional organization means knowing more about influence networks that get things done (policy networks) and the larger communities that these networks exist within. In this section, policy networks are presented as embedded social capital generating entities within larger communities, all spanning organizations and / or governments. This section begins with policy and network definitions, and closes with a description of the key variables in a high capacity network so that educational technology leaders can ponder those parameters - with an eye to generating robust organizations as they lead ET developments.

Policy Network

Originally, policy network analysis was created as a response to the limitations of public choice (competitive) hierarchical policy and organization models in efforts to better explain how people organize their interests in order to react and to get policy (making) work done (Wilks & Wright, 1987). Because older linear, rational choice institution-based frameworks were found lacking in their capacity to describe the reality of government / industry relations in an increasingly partnered government and institutional (information age) world, a new frame of analysis was needed (Lane 1995). Rather than conceptualizing government as a benevolent distributor of resources to competitors, network policy analysts accepted that government/industry or sectoral partnerships/relations today are the norm (Pal, 1997). The utility of traditional public choice, public policy or public administration models to describe how such interwoven, codependent governments, industries and sectors organize their interests was deemed deficient, so policy network research emerged (Atkinson & Coleman, 1996). Policy issues or problems are no different than strategic or operational problems in an organization, for policy is defined by the policy network framework theorists as a process – a reaction (or inaction) to an issue by a group of people (Coleman & Skogstad, 1990) who coalesce from a larger constellation of individuals (a policy community) to act on the problem (to solve it). Because networks are organizations, and since organizations are knowledge (Van Wijk, 2003), this author suggests that the process of interest organization is not far different from knowledge management (KM) (knowledge transfer and flow), and that policy network conceptual frameworks are very similar to knowledge management networks. In other words, knowledge management theorists may use policy network capacity models to define (or design) high capacity

knowledge networks. For example, consider the ET leader who must negotiate copyright protocols for a distance project that involves information that will be generated across several universities and states. The complexity of people and activity in a large project is huge, but if, as leader, you understand what moves people to work in vibrant, codependent networks across governments and institutions, that complexity is rendered simple if you consider the nature of high capacity networks (at the end of this section). Older bureaucratic and functional leadership requires a much more complex, incremental approach – today, network architects must understand KM too.

So we can consider the ‘organization’ of a big project to be a collection of actors who are reacting to a problem or challenge as they organize what they think is important (about the problem). We see study them as they subsequently go about the process of developing tangible, tactical or strategic responses to that problem (solutions). The exact interactions are not as important in a study of change-capable organization compared to the importance of knowing the type of process this group or network exhibits. In the neo institutional or codependent groups of today, Institutional actors do not identify, rank and solve problems in isolation, and they do not necessarily organize themselves hierarchical or bureaucratic structures. They can coalesce or come together from a constellation (community) of actors who have similar interests – in effect, forming a knowledgeable group of actors who create a network to get work done (Alvesson, 1996; Garcea, 1997). Do we organize our teams with this knowledge, considering these organizational factors in educational technology field?

To demonstrate: If water rights become an issue (or problem) for a collection of farmers, industries and governments in a region, you can safely bet that a collection of interested individuals will form (with management or perhaps without it) to generate a response and to push for solutions. What has been described here is the identification and ranking of a policy issue being across institutions, and then organized by people within a network or pattern of relations. These people may (or may not) successfully create a solution to the problem by working with actors across departments in a company, from various farms, and from across the government agency responsible for the sector, depending on their motivation, and common interest, and on their collective capacity to organize their interests in order to act (to solve the problem). This is complex activity to model, and network analysis allows us to render these types of emergent, pressing and sometimes quick-forming pan-institutional processes simply (Lane, 2000). There is value rendering such complexity simple. In a business or corporate setting, the same pan-institutional issues and resulting activities (processes) can occur when two companies merge. For example, say two different compensation schedules need to be negotiated because of a new partnership formed by merger. Some people in both the new organization will be motivated to achieve a certain solution over other possible solutions, and they will be motivated to work together to define, rank and organize their key interests or issues, to exchange knowledge, and to work to create a solution or response. This will occur no matter how far flung the various divisions or regions are geographically if the issue is important enough (Coleman & Skogstad, 1990). Because labor laws and government regulations may differ in different states, government may be involved in the solution as well. The capacity of the network to find and organize its interests will be important for all concerned, so that the process serves some end or solution (work). Wise Educational Technology leaders in the near future should be able to craft such a network for success, or at least to describe the parameters that characterize such a high capacity network.

In the next section, this paper demonstrates, briefly, the findings from a study on how three universities in two states organized their interests to set the educational technology (issue) directions, investing millions of dollars while indirectly affecting hundreds of thousands of students and many faculties. Policy network study is a study about what issues draw people to an action network, about why they were drawn to the issue, and about how they organize their interests, in patterns or structures (called networks) to make things happen. It is a study of the how of networks, not only of the whom and what of networks. In policy network study, individuals or actors are analyzed at the micro level, and the network (pattern) is analyzed at the meso or neo-institutional level. Because interest (knowledge) organization processes are studied and interpreted using an extension of the functionalist (descriptor only) policy network canon in this process, a post hoc analysis can interpret the nature of the interest organization process itself – and that information can inform network design for ET leaders who are engaged in creating high capacity or high social capital generating networks in similar situations (Kowch, 2003).

Viewed from an ontological perspective, the policy network canon still provides mostly functionalist sociology and organization theory frameworks too, but leaders need to consider the way actors view organization (and leadership) processes as well., as the author found that leaders who see organizing as a bureaucratic process are essentially left out of influence networks that are fluid and post bureaucratic. This is why very few educational technologists were nominated to the educational technology influence network in the

Western Canada study (only two were nominated from a possible sample of over 60). When designing high capacity networks (high capital networks) the concept of neo-institutionalism is helpful in breaking the bounded rationality proposed by internal/external institutional analysis (Lane, 1995). The neo institutional construct is particularly useful when designing or interpreting partnered organization processes (networks) that might not function entirely bureaucratically, hierarchically or even as closed systems (Kowch, 2003). Neo-institutionalism is the condition where, in a disaggregated state (where government and industry share in responding to issues), institutions have considerable autonomy to organize interests and to create strategies for problem solving. That autonomy is of course a function of the capacity of the institution to exchange ideas, and upon the pattern of relations by they choose to exchange the flow of ideas (Atkinson & Coleman, 1996). The basic unit of analysis at this institutional (meso) level is the pattern of relations between individuals who depend, to varying degrees, on each other to exchange (and to generate) information while they organize their (main) interests or problems (Howlett & Ramesh, 1995). Neo institutional interpretive frameworks allow us to characterize both internal and external (pan institutional and community invested) representations as one network and the concept maps well with the increasingly necessary flexible, recursive or constructivist ontologies found in ET praxis (Salomon, 2000).

Characterizing high capacity networks

According to Coleman & Skogstad (1990), high capacity issue organizing policy network actors possess the following characteristics:

- (1) a clear concept of role in the process or organizing things,
- (2) a supporting value system (supporting the network defined goal)
- (3) a unique, professional ethos,
- (4) an ability to generate information to answer unanswerable questions,
- (5) an ability to maintain cohesion within the network
- (6) an ability to organize and manage complex tasks, leading to a work output (result), and
- (7) the ability to rise above the (near term) self interest of the group (network).

In addition, Garcea (1997) notes that high capacity actors have three characteristics that affect the capacity of networks to get things done: (1) interests; (2) institutional contexts (programmatic or political, & managerial and financial management capacity) and (3) ideologies or ontologies. Subjective or objective ideologies or ontological stances to the organization task are important to know, as they are important factors in the interpretation of the capacity of the response networks (Kowch, 2003). By linking management models describing the capacity of networks to get things done (and to handle change), Kowch borrows from Ibarra (1992) to describe the dynamic potential of policy networks to get issue organization (knowledge) work done. Ibarra's model was based on previous work in social networks (Granovetter, 1973) and Kowch used it to add analytical validity at the meso level (network) analysis of policy networks to provide a complimentary description of loose or tight ties. Both methods yielded the same network descriptions for network change capacity and innovation capacity. So these are the criteria by which the process of organization, evidenced by policy networks, is characterized. The result, to long to mention here, is a method for characterizing the change capacity of networks that generate positive social capital in a neo-institutional or complex organizational setting. The type of organizing the network does (i.e. pluralist, corporatist, concertist, statist) can also be identified by doing an autonomy analysis (Lindquist, 1996). In this paper, only the network capacity determination will be demonstrated for parsimony reasons. From the previous literature, it is clear that high capacity networks also contribute to high social capital generation networks. From descriptions and analyses of these three policy network case studies, performed at the micro (actor), meso (network) and macro (environment) levels, the author then presents findings and a more detailed analysis of policy issue (knowledge) organization networks at the institutional level.

High and Low Capacity Educational Technology Leadership Network Examples (High and Low Social Capital Generators)

A Low Capacity ET Leadership Network Case – Too Many Interests, Some Codependence in a Workflow Network

In earlier research (Kowch, 2003) a low capacity case ET leadership network describes a closed system of faculty and administrators who came together with two issues or fundamental motivations to organize in

mind . This caused a cleavage to appear in the network diagram (Figure 2). One low capacity cleavage had weak ties to the other interest group, and collected because of self interest in distance education. The higher capacity cleavage (a larger group) came together to solve problems related to technology because they believed the institution required a progressive image. Both groups were unsure of their role in the network as policy makers, while all actors exhibited a supporting ethos and value system to serve students and the institution. The two interests in the influence network therefore decreased the cohesion and the organization capacity of the network to get policy done or to prioritize what (knowledge) mattered most (and they readily admitted this fact).

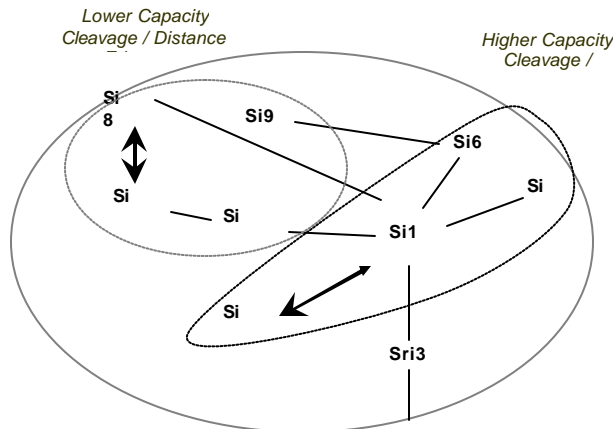


Figure 2: Low Capacity Educational Technology Leader Network Case

The “distance cleavage” emerged as a subsystem, and evidenced only a weak connection to the government through the other cleavage. All actors in the case were found to have a strongly bureaucratic or objectivist organization ontology, and most actors preferred to submit decisions to their respective committees (85% of the members sat on each other’s committees). Most actors knew that the super ordinate committees they chose to send policy creation (work) “up” to had no funds or policy instruments, and likely would not pass the recommendations. As such, this is a hierarchical work flow network that is tightly knit, impeding innovation and flexibility to respond to challenges (Ibarra, 1992). With weak ties to a government member who also looked to the committee for interest organization, this network was classified as a pressure pluralist organization, where both actors and cleavages created a low capacity issue organizing network with low social capital generation capability.

A High Capacity ET Leadership Network Case – One Interest, High Codependence, Loose Ties in an Non- Workflow (non bureaucratic) Network.

Figure 3 depicts the structure of the “Calliope” University case, which among the three cases showed the highest capacity to organize interests across institutional boundaries. In this macro environment, the government had strategic plans for the universities, and required the universities to generate plans that aligned with government plans about education and technology – and the government had in place funded policy instruments (grants) targeted at anyone in the university system, so the policy (macro) environment was far more organized than in the other two cases, where no similar government plans, policy or alignments with the institutions was evident.

ET Leadership Network Motivation: Overall, the reason for people coming to this to work out the problem responses was found to be a desire to increased market share for the institution, and every member indicated this one issue or interest driving their (network) organization. Though holding a predominantly determinist view of education technology, these people come together to set policy based on the generally understood idea that technology will give a market edge to the university. They came up with this understanding as a group, but held the ideal individually as well, and actors came to this network from across many faculties, government agencies and administrative departments. A key interest or common knowledge is what holds this network together - at the table so to speak. Everyone understands the issue and has “bought into it”.

ET Leadership Network Composition: These 9 actors have a central core of 4 service group experts, with the others being physical plant people and executives from the academic and administration chambers, also including people from the professorate and related (higher education) government senior officials. The core or non-workflow (non hierarchical relation – non bureaucratic) core of this group change depending on the ET

leadership task at hand.

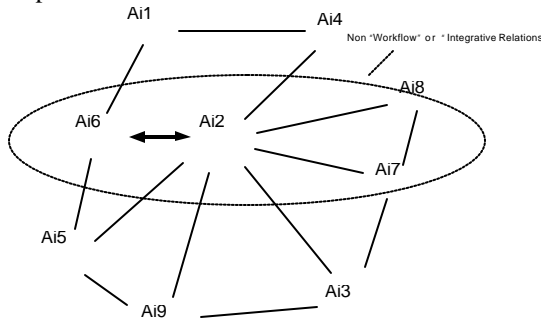


Figure 3: Network: High Capacity Educational Technology Leader Network Case

ET Leadership Network Capacity: In this network, people from across the institution share one interest with the government and they have the same joint concern, so both the government and the institutional network demonstrate a high degree of autonomy and capacity in organizing their interest (they are both doing what they want to do, depending on each other to organize the one main issue – market share gain), and they both are able to articulate and solve the problem independently (they cooperate in that process as a network, without hierarchical structure). An (aggregated) but more detailed description of the key capacity characteristics of this network follows, presenting findings and analysis for each criterion used in policy network capacity determination.

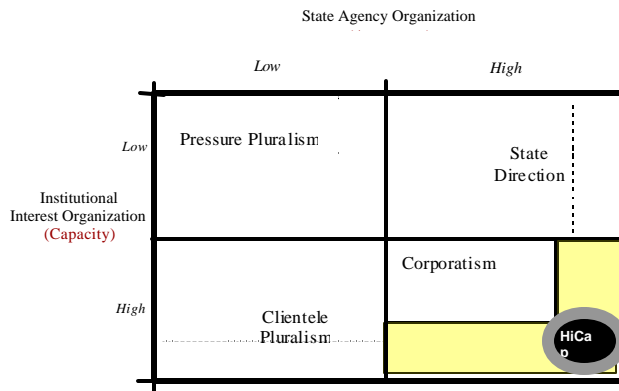


Figure 4: Network Type: High Capacity Educational Technology Leader Network Case

Though it is beyond the scope of this paper, it is possible to characterize complex network associations from across and well beyond what we think of as ‘the organization’. In the study of educational technology leadership, no one nominated by other influential actors thought that they were leading university education technology policy – but they were. By studying influential leaders who did not know all the participants in the network, this model permits us to understand the process of leadership, not only the product. Deep analysis of the leadership and organization capacity of these networks is possible by studying how they organize their interests by applying advanced organization theory. If we know how they organize, we can design for change.

How Can Educational Technologists Create and Lead High Capacity (Social Capital Generating) Educational Technology Efforts?

In this paper, the author argues that a new, information age (Reigeluth, 2001), neo institutional approach to understanding the processes whereby our organizations deal with educational technology issues is necessary. As an educational technology field, we need to bring our management domain theory up to today’s organizational theory, education administration and knowledge management (business school) levels. We also need to consider the organizational phenomenon and larger, macro issues like economics, politics and history in our plans to make our work sustainable and manageable within increasingly complex systems. We must pay

particular attention to the kind of purpose we communicate when we create educational technology projects, and plan to take a distinct leadership role in the generation not just of processes for implementation and management, but in the design and guidance of bonding, bridging or linking organizational networks that accomplish our projects. We must also consider policy and politics, like all education leaders – finding ways to render leadership of extremely complex phenomenon simple, as we can with the social capital concept. Educational Technology matters, and our community and field offer social capital generation in buckets to our governments – perhaps we need to account for that a bit more.

The ET field is increasingly in a position to provide very high social capital generating projects from our field, and we need to be able to account, and be accountable for such foresight, change and leadership. A good beginning is the inclusion of leadership theory and philosophy in the Educational technology graduate student programming, such as that under way at the University of Calgary.

Such changes may indeed reflect the recent changes suggested by social scientists at large in a plea to make social science really matter again (Flyvbjerg, 2001). Flyvbjerg suggests that as social scientists, we must move along among the three intellectual virtues Aristotle proposed, from episteme (scientific knowledge of our field) to *techne* (pragmatic, variable, context-dependent knowledge of our field) to *phronesis* (a values based, action oriented and variable rationality less instrumental in nature). Indeed, this author found that while some educational technology leadership networks governing over 200,000 faculty and students in two states had high and low capacity networks, both networks maintained a functionalist (*techne*) view of both educational technology in education and educational leadership. By broadening the field to include leadership and political science theory (social capital) as a model for describing complex issues, patterns and relations in the information era, perhaps we can strengthen our social capital capacity to account for our ET project successes in this information age.

References

- Alvesson, M., & Deetz, S. (1996). *Critical theory and postmodernism approaches to organizational studies*. London, England: Sage.
- Atkinson, M., & Coleman, W. D. (1996). Policy networks, policy communities and the problems of governance. In L. Dobuzinskis, M. Howlett & D. Laycock. (Eds.), *Policy studies in Canada: The state of the art* (pp. 193-213). Toronto, ON: University of Toronto Press.
- Bennis, W., Geary, R., Gery, G., Burke, W., Juechter, W., and Tichy, N. (2003). Dead end or an open road? What lies ahead. *Training and development*, 57, (1), (pp. 32-44).
- Carr, N. G. (2003). IT doesn't matter. *Harvard Business Review*, 81, 5-12.
- Coleman, J. S. (1988) Social Capital in the Creation of Human Capital, *American Journal of Sociology*, 94 (Suppl. 95): S95-S120
- Coleman, W., & Skogstad, G. (1990). *Policy communities and public policy in Canada*. Toronto, Ont: Copp Clark.
- Dickson, M., Gewirtz, S., Halpin, D., Power, S and Whitty, G. (2003). Education action zones: Model partnerships', in Franklin, B., Bloch, M. and Popkewitz, T. (Eds.) *Educational Partnerships and the State: the paradoxes of governing schools, children and families*, New York: Palgrave Macmillan.
- Fullan, M. (2000). Leadership for the 21st century: Breaking the bonds of dependency. In *The Jossey-Bass reader on educational leadership* (pp. 156-164). San Francisco: Jossey-Bass.
- Flyvbjerg, B. (2003). *Making social science matter: Why social science fails and how it can succeed again*. Cambridge: England. Cambridge University Press.
- Garcea, J. (1997, June.). Saskatchewan's aborted municipal service act (Bill 33): Pegasus or Trojan horse? Paper presented at the Canadian Political Science Association Annual Meeting, St. John's, Newfoundland.
- Hall, I. (1994). *Policy networks and policy communities*. Unpublished Doctoral Dissertation. Saskatoon: SK. University of Saskatchewan.
- Hargreaves, D. H. (2001). A capital theory of school effectiveness and improvement. *British Educational Research Journal*, 27, (4), 487-502.
- Howlett, M., & Ramesh, M. (1995). *Studying public policy: policy cycles and policy subsystems*. New York: Oxford.
- Lane, J. E. (1995). *New public management*. London, England: Routledge.
- Ibarra, H. (1992). Structural alignments, individual strategies, and managerial action. In N. Nohria (Ed.), *Networks and organizations* (pp. 165-188). Boston, MA: Harvard Business School Press.
- Kowch, E. (2003). *Policy Networks and Policy Communities in Three Western Canada Universities: Neo*

- Institutional Responses to a Pan Institutional Issue. University of Saskatchewan. Doctoral Dissertation.
- Reigeluth, C. M. (2001). What every AECT member needs to know about systemic change: The beginning of a dialog. *TechTrends*, 46 (1), 12-15.
- Rhodes, R. A. (1996). From institutions to dogma: Tradition, eclecticism and ideology in the study of British public administration. *Public administration review*, 56, 507-523.
- Salomon, D. (2000). Toward a post-modern agenda in instructional technology. *Educational Technology Research and Development*, 48, (4), 5-20.
- Senge, P. (2000). Give me a lever long enough and single-handed I can move the world. In *The Jossey-Bass reader on educational leadership* (pp. 13-26). San Francisco: Jossey-Bass.
- Van Wijk, R., Van Den Bosch, F., & Volberda, H. (2003). Knowledge and networks. In Mark Easterby-Smith and Marjorie Lyles (Eds.) *Handbook of Organizational Learning and Knowledge Management* (pp. 428 – 454). Oxford: Blackwell Publishing.
- Wheatley, M. (2000). Good-bye, command and control. In *The Jossey-Bass Reader on Educational Leadership* (pp., 339-348). San Francisco: Jossey-Bass.
- Woolcock, M. & Narayan, D. (2000) Social capital: implications for research and policy, *World Bank Research Observer*, 15: 225-249.