Seeking New Connections:
Learning, Technology, and Systemic Change

Executive Summary

A summary report of an invitational seminar hosted by the **American Association of School Administrators** and the **Northern Telecom *Integrated Community Networks* Group** at the Aspen Institute in Wye, Maryland, August 22-24, 1994.

CONTEXT

It was a meeting born of frustration; intentionally designed to push that frustration to its breaking point; and then to provide an opportunity where the only reasonable choice was to look at the situation in a different way -- a way that would begin to surface and learn of new possibilities for systemic improvement of schools.

What frustrations brought twenty-six individuals together at this place? First, AASA and Northern Telecom developed this unique experience because they both are in the "connecting" business and shared certain frustrations.

- AASA's members are chief executive officers of total organizational systems. In this leadership role, they are accountable for the functional "bridges" over their district's "white spaces." They must understand and communicate a vision of how all of the organization's parts connect to children's learning; and must have ways to create and maintain those system linkages. Yet their systems don't always act like their conventional system "maps" [organization charts] predict they should.
- Northern Telecom also is in the connecting business -- it develops and sells people connecting and system-connecting technologies. But in working with schools and communities, it must deal with people who do not view themselves as working [or have opportunities to work] within systems of interdependent functions.

The invited participants -- who included teachers, educational and community leaders at all levels, and those attempting to develop new methods to facilitate their work -- represented a critical mass of *system-caused* frustrations. Each however had experienced their frustration at different parts of the system and, usually because they had envisioned, developed or implemented a potential system-enhancing improvement that "the system" seemed to resist. The membership included:

- seven superintendents and *former* superintendents [the "former" status was, in many cases, a by-product of that system role];
- three persons involved with other community services impacting children and families;
- twelve individuals involved with attempts to improve education at either national, state or local levels through research or development of new practices. One was an experienced consultant in quality process management. Five of these had direct experience with new applications of information technologies that had only been implemented in isolated projects. Regardless of the nature of the technology or improvement, or the level applied, each individual had discovered how much supportive linkage to the rest of the system is actually required in order for new practices to be maintained and become a permanent increase in organizational capacity; and
- a nationally-known author and consultant - Margaret Wheatley - whose ideas and name is now linked with those providing new perspectives on organizations and leadership such as Drucker, Deming, and Senge.

Shared frustrations with a "system" of education that everyone felt constrained their effectiveness was one factor that brought these people together at an inconvenient time of the year, and at some personal expense. They also were attracted by the challenge of exploring a different way of looking at and understanding this "system" -- a way that AASA and Northern Telecom believed made sense. The invitation letter had stated:

> "This working conference will provide a forum for the identification and documentation of the *connected information infra-structure* of the core system of work in American K-12 education -- the school district. We will explore relationships between the work of students, educators, and the people and organizations in the community who support them. In this effort, we are seeking a base for a new conceptual model of schools as effective knowledge building, information-nurtured, continuous learning organizations set in communities of collaborative support. We believe that viewing schools, and in particular school districts, as work settings can provide a perspective of schools as manageable systems of purpose-driven information-fed work. Through that lens, one will be able to see and understand –
>
> (1) the *connectedness* of the work that shapes individual roles and relationships; and
>
> (2) new possibilities for *re-aligning* them and supporting the *collaborative interactions* necessary to more effectively accomplish their common purpose -- student learning.
>
> This new system picture and framework for understanding can serve as a "map" from which possibilities for effective, permanent changes in capacities can be identified. From that base, one can then determine the nature of the information required to sustain that capacity, and potential roles for today's information technologies to make it possible.
>
> We recognize, however, that in two days together we can do little more than, like an artist, sketch an overall outline that frames all the essential elements in approximate relationship to each other. But even at that level, we anticipate that this alternative way of "seeing" what already exists will allow us to see new possibilities for action."

CONTENT

The two-day meeting was designed to provide a forum where individuals could learn from each other, and create something tangible from which to work in the future. Specific objectives were to:

1. Since a system is a function of its connections, first identify currently held assumptions underlying the ways the educational work system is understood and perceived to be connected now. How do the parts relate to the common purpose of schooling, and to each other?

2. Jointly begin development of a "map," based upon different assumptions, within which a community can be seen as an interdependent work system of individuals and organizations with common interests in the positive development of their children. On this map, to the extent possible, begin to identify the *key functional relationships and interactions*, the *continuing information exchanges* required to develop and maintain them as organizational processes, and the critical *information-generating, process support,* and *connecting* roles for information technologies at this point in time.

3. Serve as a catalyst for the development of relationships to continue beyond the session that can develop creative vehicles for on-going work to test the hypotheses and strategies developed at the meeting.

Objective 1:

- Much of the meetings first day was spent producing the *cognitive gridlock* that occurs when anyone today tries to understand education as a "system." Participants were asked to identify the observable elements of a school system; group them in categories based upon some assumption; and then analyze the effects of each category on the others. One group, frustrated with the complexity, fell back to analyzing and raising questions about the system's "parts" hoping

that, if they could just fix them, everything would eventually fit. They, as have others who take this route to systemic understanding, ended up powerless to act in any way that would affect the system as a whole.

• Besides increased frustration, an almost universal outcome of these exercises was the sense that schools are driven by external factors, and largely beyond their control. The strongest influences on what, how and why children learn come from outside the classroom.

Objective 2:

• At that point, two different analogies were drawn to help understand why this condition exists and seems impervious to change. First to a hospital where the what, how, and why of what a client receives is driven from the inside -- in fact, from the client's specific needs. Why does society accept a model of responsive management for hospitals and not schools?

• To explore that question, a second analogy was used, referring to an earlier time when a Polish astronomer named Copernicus complained about maps of the solar system that had been used for 16 centuries...

> *"It is as though an artist were to gather the hands, feet, head and other members for his images from diverse models, each part excellently drawn, but not related to a single body, and since they in no way match each other, the result would be a monster rather than a man."*

Copernicus' "solution" was to provide a different paradigm for understanding everyday reality. The problem, he felt, was the theory behind the maps. Because it was based on direct observation, there had been little reason to question it, and it did work pretty well for simple tasks. Farmers could plant and harvest, and sailors could navigate. Each day, people could go on with their lives, and what they saw with their own eyes was what the theories predicted... the sun, stars and planets moved around the earth. In fact, they could even predict the position of the stars and the planets from season to season. Of course, there was some problem in predicting the length of the seasons, but astronomers could correct any discrepancies by adjusting something else in the system.

In seeking to understand what could be observed in the world around them ...much as we do with schools today, ...mankind had created a theory from what it had directly observed, without realizing that it never really saw the connected *system* the theory predicted, and which they drew abstractly on their charts.

• Faced with cognitive gridlock seminar participants, like Copernicus, needed ways to make sense of how the whole school system is supposed to work -- especially how the parts relate and connect to each other. And that was the problem! While the parts may be visible, the relationships or connections between them are not; and there was even disagreement on exactly what these connections are. Just as in Copernicus' age, schools have operated for a long time on assumptions and theories of how things are connected...assumptions that seemed to match our observations [both as students and adults] of what happens in schools... and which seemed to work... most of the time.

• At that point of the seminar, it was time to question the assumptions and "theories" underlying the system structures developed during the initial exercises. Today, with every major educational reform initiative attempting to develop a coherent systemic strategy, understanding schools as purposeful, *manageable systems* becomes a critical prerequisite. And, as with Copernicus, development of a different system map, had to start with the invisible *theories* that frame the "windows" through which we make sense of what we do.

• The following assumptions were proposed as a way for understanding, and doing something about, the systemic nature of the managed environments that are intended to support children's learning. Much like Copernicus' theories they, too, are based on a "new" science rather

than observation -- in particular, the critical learnings from cognitive science research which have universal application to the behavior of children and adults in schools.

Assumption 1: Learning: A *natural* process, not a choice

We started with an assumption of a pre-existent natural process -- learning -- over which, much like breathing, we have little choice. Every child does learn, not "can" learn. This hypothesis has two consequences for schools.First, when learning is a fact, and not a possibility our choices of actions are entirely different. Managing an environment that can respond to the needs of unique individuals who share a common process is an entirely different problem -- and one much easier to solve. [This is much closer to what we assume in hospital management where they know ahead of time that each client is a bundle of common processes -- respiratory, circulatory, digestive, etc. -- but the processes operate at different levels of development or wellness. Therefore, they “manage" their "treating" environment in ways that allow their responses to client needs to *start* from where each individual is.Second, if human's are "hard-wired" for learning, then this applies to the *adults* as well as the children in schools.

Assumption 2: The *Workplace* has shifted

The first assumption has two consequences for understanding the work of schooling. Every child does learn [much as he/she breathes, etc.,] but then so does every adult who works in the schools. That humans are "hard-wired" for learning has become the core concept of the modern workplace where, as Secretary of Labor Robert Reich has noted, *"...your most precious possession is the people you have... and what they carry around in their heads."*

This can be seen in *World Class* business and industry. There, the nature of the worksite has shifted to the *mental processes* of each member of the organization, and therefore learning [continuous improvement] has become a natural workplace requirement. The mind has become the *workplace* and organizations can be envisioned as *regularly-connected minds.*

The workplace of schooling, similarly, can be found in the minds of educational practitioners. Although the work of schooling appears to be the *visible acts* of educators as they respond directly or indirectly to the learning needs of children, the actual work is invisible -taking place in educators' minds as they determine the most appropriate responses. Any permanent changes in schools can only come from changes in that workplace where personal and organizational routines are stored in the form of beliefs, assumptions, and previously-effective strategies.

Assumption 3: *Information* feeds the workplace

If school practitioners are cognitive beings whose actions are directed by their own conscious and unconscious thought processes; then the *information* that feeds those thoughts and choices, becomes a primary resource for effective work. But in schools, access to this resource is limited because this daily "work" (responding to situations as they occur) is done in isolation from peers and experiences of others.

Outside of schools, the ways that information is generated and exchanged plays key roles in the alignment and flow of work. Data is transformed into information, then into knowledge... and with the filter of experience... into wisdom. When that wisdom transfers to new organizational processes, the organization's capacity increases. It, too, has learned.

Assumption 4: We already have, and largely accept [outside of schools,] *information technologies* that can generate, combine, and order information; provide timely access to it, and connect mental "workplaces" into problem-focused networks.

Outside of schools, therefore, technology supports changed roles and relationships, trade-offs of time and resources, and the aligning of accessible support to the core human work of the system. But inside of schools these available tools have yet to find a place... and for good reason. They have been applied to only half the work of learning going on in the organization -- the student's - and even then their use has been weakened by an inaccurate theory of what that work actually is.

For instance, ask most people what the work of schools is, and the answer generally will denote some form of delivery or transmission process -- "*communicate* culture, *disseminate* knowledge, *transmit* information, etc." Yet the job of schools is no more the " delivery of information" than the job of hospitals is the delivery of medicine. True, medicine is" delivered" in hospitals, but only through a *managed work process* that tries to match it appropriately to need. Thus the work of hospitals takes place in a work setting structured and managed to deliver appropriate service based upon continuing *individual* diagnosis.

Most educators believe that is the nature of their work, also. But they attempt to accomplish that work in a setting that has been structured and managed around the concept of delivery rather than response. The strength of this "delivery" paradigm can be compared to that of Ptolomy's map of the solar system. It can be validated by observation, even though cognitive science now suggests that learning is not delivered, but "constructed" as part of each student's intrinsic need to make sense.

The unfortunate, and major, consequence of this missing understanding of the "work" of learning -- and how the work of teachers relates to it -- is that technology cannot effectively facilitate that work [its primary role in all other organizations]. Thus, America's schools remain largely a technology-free zone, and technology today remains outside the national conversation about educational reform. When it is addressed, technology usually is seen as a separate element rather than as an enabler for the changed roles and relationships that are the connecting points of restructuring efforts. We have numerous examples of technology's effectiveness with real children, in real classrooms. But without a context within which to make sense of them, they appear as isolated demonstrations of technology.

Assumption 5a: If the workplace is the *mind*, then organizations can be seen as people in roles, who are connected by a structure of *relationships* maintained by the quality and nature of the *information* that passes between them.

An organization's structure therefore can be found in the quality and nature of the information exchanges that create, reinforce, connect, and maintain work relationships in the organization.

Assumption 5b: As a *system* of connected parts, that organization then can be "re-shaped" or "re-structured" by changing the information and communication interactions and patterns among those parts,

Results-driven management processes require an *information infrastructure* that goes beyond data, and traditional concepts of management information systems to provide support of the organizational interactions that align and connect isolated actions of individuals and work groups as they fulfill the organization's aims; and which ensures that "data" turns into institutionalized knowledge as the organization "learns."

The "*Learning Organizations"* required for survival in today's dynamically changing world are not possible unless we can create connected organizations of learners.

- Operating with Different Assumptions

After discussion, and validation of these assumptions, several of the participants had the opportunity to share examples of the types of information technologies and applications that they had designed, developed, or had been using which could generate the types of information required and provide the connections to make it accessible. Some of these included:

q Computer-supported Intentional Learning Environments [CSILE] software that draws upon cognitive science principles and studies of expertise and expert communities to link students into collaborative learning environments.

q Process tools for collaborative work within and between organizations, including Tele-CSILE, an extension of the CSILE process to the adults in the school and community learning environment.

q An interactive network linking 21 sites for voice, data, and video in the Southeastern US.

q IIMS - an instructional management system that helps educators "make explicit," understand, organize, analyze, and manage all information associated with instruction in ways that facilitate collaborative planning and design.

q A systems model-based information management system -- linking all elements of instruction and creating interdependencies among staff-- that has been validated and implemented in several sites.

q Several examples of new types of community partnerships between business and industry, and between social services and schools.

q Co-host, Northern Telecom, shared their unique role as not only technology provider, but integrator and coalition builder in the development of regional and state networks. Their *Integrated Community Network* concept was presented as places where individuals and institutions can access the best resources their community has to offer -- for education, health care, public safety, government services and commerce -- utilizing Northern Telecom's state-of-the-art interactive video, data, and voice communication technologies. Networks like these are providing communications infrastructures for schools and communities in places like Mississippi, Iowa, North Carolina, Maryland, Pennsylvania, New York, Washington and a growing list of states and provinces across North America.

q Co-host, AASA, described their efforts to develop an understanding of the connectivity crisis in schools and their communities today. In particular, their focus has been on roles of local leadership in helping people envision themselves as a system; and the roles for communications technology in allowing them to operate that way. This meeting, and AASA's new video, Schools that *Make Sense* were cited as examples.

• Participants re-formed into smaller work groups and attempted to "re-map" their concepts of school systems using the values inherent in the new applications of information technologies described above.

Expected limits on time hampered completion of this activity, but a sufficient understanding was developed to generate insights, learnings, and a sense of general direction for future activities.

ACCOMPLISHMENTS

Personal Insights:

"It got me thinking in some new ways about the things that I would like to be able to make contributions to changing in education

Comments, both at the seminar and since, provide indications of the personal nature of takeaway insights developed by participants during two days of interaction., and I also was able to see again some of the barriers to these changes. It was also clear to me that I need to develop some new ways of communicating about some of the issues, concerns and goals that are important to me. So all in all, it was quite generative."

"It was an eye-opening experience..."

"Before the meeting I was frustrated by perceptions of "quality management as a thing to be installed" and not a way of thinking and learning. Now I can see how "technology seems to be both glue and grease in making the connections between quality and schools."“We all have good intentions, but create things that aren't biodegradable when they're no longer useful. We have to create things that have the ability to change built in.... The least biodegradable are our mindsets.”

"I see that relationships - especially between stakeholders - are more important than the boundaries of a system. We must focus on the nature of these relationships and identify which relationships are more meaningful. The currency of the relationship is the information exchanged; and the purpose of the system should drive the exchange. But we sometimes need tools to generate the information and allow it to flow."

"...this type of networking is critical to our making real progress in bringing about educational reform."

And from Margaret Wheatley: "...these events are much more important, and will create more important change, than anyone thinks."

Organizational Insights:

What have the meeting's sponsors and designers learned from the experience? While we have not had sufficient interaction since the meeting to clarify and pull together all of these thoughts, some ideas stand out as worth further exploration.

First, there was sufficient validation of the general purpose and design even though the 48 hour time frame severely limited any specific outcomes.

Margaret Wheatley's interaction with the group added valuable additional dimensions to our understanding by focusing on the nature of the experience in which we all were involved. It wasn't the "system map" itself that had value, she pointed out, but the process of developing it. "The value of a system map is in doing it ... "only those involved will have the passion for it. Others will say "so what? The important thing is that the system figures out that it *is* a system. After that, it will figure out what its supposed to do."

What might be the dimensions of a process that could help schools and communities both think AND act *as a system*?

For members of a community and school district to act as an interdependent system there must be commitment, belief, and experience to drive them both. That is, they must *want* to, and must *believe* it is necessary, possible, and the best way to accomplish their mutual purposes. This requires ways to not only perceive themselves differently, but also a *reason* to do it. Both must be driven from the inside -- from the prior experiences of the participants. Then they need ways to generate a new base of equally valid experience to counter old, safe, and comfortable ways of working "independently."

Such a process might be considered as having *push* and *pull* dimensions -- generators for the push of internal dissatisfaction and for the pull of external hope. Components of such a process might include [although not necessarily in this order]:

- "You can't shift your paradigm until you know what you're shifting it from," one participant had noted. From our experience at this meeting we can see the importance of not just bringing a group to the frustration of cognitive gridlock, but also having them understand *why.* Fundamental beliefs about the purpose around which the system is structured must be challenged. Ideally, one would want a group to give up hope that conditions could be "fixed" by business-as-usual.

- Then they need the *pulls* of common purpose and possibility. This requires means to be involved in experiences that allow them to picture themselves as a system with parts that affect each other, as they attempt to accomplish a common purpose. And to be meaningful, they require access to experiences of others that indicates it is possible to act that way in settings similar to theirs.

- After that they need continual *push* and *pull* experiences that can drive them through the changes required in previously successful ways of working each day. They must have positive, small scale experiences working AS a system from which they can learn. This will

require training, new tools and support, and information from each other not previously accessible.

It is at this point that *quality management* and *information technology* enter the picture. Quality management helps them identify and align the connecting processes, and communications technology makes it possible to connect and "feed" them with required information. Initial training in teaming, tools and processes [similar to those used in quality management] can be immediately applied to real problems currently limiting effectiveness. Expanding the teams through telecommunications also provides immediate values that justify the "costs."

- Based upon what would now be personal experience of new possibilities for working together, they need to re-picture themselves as a total continuing system. What would work look like if all potential positive influences on results were optimized? What new relationships and supporting roles can they perceive? How can people be connected to operationalize them? How they can access their intelligence -- what do they each need know and do for them to continue to operate that way; who has that information or knowledge; what technologies can efficiently create the connections?

- Start operating that way with continual training and learning from daily practice so that old roles and relationships are continually discarded as less effective.

NEXT STEPS

Seeking New Connections had been planned as “a forum where we can learn from each other, and create something tangible from which to work in the future.” In a seminar closing brainstorming session, and in subsequent communications, participants identified areas for further exploration and collaborative development. These included:

- Pursue opportunities for educational and technology leaders like AASA and Northern Telecom to inform the current public policy discussion regarding national information *highways* with additional insights about the integrated community "road systems" required to take full advantage of the national infrastructure.

- Development of a computer simulation microworld that would allow individuals to experience the nature of information-supported, positive interdependence in the school work setting.

- Explore a "Toronto" Connection. At present, the Toronto area is the site of the Ontario Institute for the Study of Education, developer of the CSILE software concepts; the home of Northern Telecom; and site of the University of Toronto where Michael G. Fullan is Dean of the School of Education. Fullen, author of *Change Forces: Probing the Depth of Educational Reform* is a leading advocate of schools as collaborative work cultures and has a network of schools in a Learning Consortium that are field sites for these developing concepts. How might these three ingredients be brought together to provide the context, content, and connections for a scaled up systems model?

- Explore an "Iowa" Connection. In a similar fashion, Iowa is the present site of several independent efforts which if brought together could provide the context, content and connections for a scaled up systems model. This includes the Iowa City SchoolNet project, supported by community funding raised by the Chamber of Commerce, which has bee using Northern Telecom's *Integrated Community Networks* concepts to support expansion to other agencies; the Cedar Rapids Schools that have been a test site in the US for CSILE; and the Grant Wood Quality Center which supports applications of quality management principles and strategies in Iowa's public and private sector organizations.

- Identify additional corporate and/or research partners who can support appropriate scaling up of the approach so that it can demonstrate systemic value.

- Identify and involve "community" and "other human-service system" partners to embed the process in the permanent community.

- Identify opportunities for Northern Telecom and AASA-supported workshops for the "Educational Technology" community which, until now, has not been exposed to these new ways of understanding system needs for technology that can allow it to organize differently.

- Explore the opportunity to apply *Integrated Community Networks* connecting technologies to selected schools and communities represented by the participants.

- Identify opportunities to apply Northern Telecom's *Coalition Building* model to the restructuring of schools and their communities through an enhanced communications infrastructure.

The **American Association of School Administrators** and the **Northern Telecom Integrated Community Networks Group** joined together in a partnership to advance the sense of what is *possible* for the healthy development of children and their families in America's communities today.

Based upon initial learnings from the experience at this Aspen meeting, we believe the continuation of this journey is not only possible, but necessary.