

The School System Transformation (SST) Protocol

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This is the second in a series of articles about creating and sustaining systemic transformational change in school districts. The first article described the *AECT FutureMinds: Transforming America's School Systems* initiative for helping state education agencies (SEAs) facilitate paradigm change in their school districts. This article describes a methodology for creating and sustaining paradigm change that the FutureMinds initiative will use to help those SEAs transform school systems in their states. The methodology is called the *School System Transformation (SST) Protocol*. Prior to describing the methodology, the authors describe the context for the design, development, and implementation of the methodology.

The Context for the SST Protocol

Before introducing the SST Protocol, we describe the context for the protocol. This context is important because it provides a rationale for the design, development, and implementation of the SST Protocol. The context describes the confusion about the definition of systemic change, clarifies how school districts function as complex systems, identifies three complementary paradigm changes that must occur to transform a school system, provides a rationale for why a school district is the preferred unit of change, characterizes transformational change as a "wicked problem," and outlines knowledge and skill-sets that we believe are required for effective change leadership.

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Paradigm Change in Public Education

This is the second in a four-part series of articles on paradigm change in public school districts. The first article, published in the May–June 2008 edition, described the *FutureMinds* initiative, a national effort undertaken by the Association for Educational Communications and Technology to help state education agencies (SEAs) build the capacity to facilitate paradigm change in their school districts. This article describes the *School System Transformation (SST) Protocol*, a detailed set of research-based guidelines to help the SEA facilitators guide their districts' paradigm change efforts. The third article, which will appear in the September–October 2008 edition, describes fundamental features of the learner-centered paradigm of education, a paradigm that is designed for learning rather than sorting students, as the current factory model of schools does. The fourth article, which will be published in the November–December 2008 edition, describes learning management systems, powerful tools that make the learner-centered paradigm more effective, efficient, and engaging.

Systemic Change

There is a resurgence of interest in systemic change, including proposed federal legislation that recognizes the importance of systemic change for helping school districts create 21st Century learning environments (i.e., the Achievement Through Technology And Innovation [ATTAIN] Act). The resurgence of interest notwithstanding, there is still a significant lack of understanding about the meaning of systemic change, and there is robust push-back against that approach from advocates of the dominant paradigm for improving schooling—the school-based improvement paradigm. Because of this lack of understanding and push-back, we first define what we mean by the term systemic change.

There is widespread confusion about the meaning of systemic change in school districts. Several different definitions of the term used in the school improvement literature comprise the main source of this confusion. The following definitions were identified by Squire and Reigeluth (2000):

Statewide policy systemic change: creating statewide changes in tests, curricular guidelines, teacher certification requirements, textbook adoptions, funding policies, and so forth that are coordinated to support one another. This meaning is how policy-makers typically think of systemic change.

Districtwide systemic change: producing changes in curriculum or programs throughout a school district. This meaning is how P–12 educators typically think of systemic change.

Schoolwide systemic change: creating change inside individual school buildings. This is the definition used by school-based improvement advocates.

Ecological systemic change: making changes based on upon a clear understanding of interrelationships and interdependencies within a system and between the system and its external environment. Change leaders subscribing to this view recognize that significant change in one part of their system requires changes in other parts of that system. This is the definition accepted by “systems thinkers” such as Peter Senge, Russell Ackoff, and Bela Banathy.

The first three definitions apply some principles of systemic change, but they do not create systemic change. The fourth definition is an example of true systemic change, but it does not always create transformational paradigm change. Thus, the one definition of systemic change missing from Squire and Reigeluth’s original compendium of definitions is the one for systemic transformational change.

Systemic transformational change. Eckel, Hill and Green (1998) define this special form of systemic change as one that:

- (1) alters the culture of the institution by changing select underlying assumptions and institutional behaviors, processes, and products;
- (2) is deep and pervasive, affecting the whole institution;
- (3) is intentional; and
- (4) occurs over time.

We have added the following two requirements to the above definition:

- (5) creates a school system that continuously seeks an idealized future for itself; and
- (6) creates a future system that is substantially different from the current school system; that is, the system must be transformed to perform within a different paradigm.

We will use the term *transformational change* or *paradigm change* to refer to this kind of systemic change. We focus on this kind of systemic change because we believe *there is no other way* to recreate school systems for success in the 21st Century Information Age.

School Districts Are Complex Systems

There is a stunning lack of understanding about how school districts function as complex systems. This lack of understanding produces change efforts that are unable to create and sustain transformational change in school districts. This lack of understanding also underpins the dominant approach to improving schooling; that is, the piecemeal, one-school-at-a-time approach.

All complex systems are composed of parts, or subsystems. The parts have parts, too. A classroom is part of a school, a school is part of a cluster* of schools, a cluster is part of a school system, a school system is part of a community, which is part of a state,

which is part of a region, which is part of our country, which is part of our planet, which is part of the universe. But trying to improve a system that complex is beyond human capacity. Instead, Merrelyn Emery says that we need to target the “system of interest” for the purpose of managing the change process. To identify the system of interest, Emery (in Emery & Purser, 1996) says we need to draw a circle around all of the departments, programs, and so on, that must collaborate daily and closely to deliver a product or service to a customer. For the purpose of improving teaching and learning, the circle goes around what we traditionally call a school system, or school district. Everything outside that circle is the school system’s external environment.

Another phenomenon that influences the performance of school systems is synergy. Synergy happens when discrete parts of a system interact to create an effect greater than the parts can create in isolation. People commonly describe this phenomenon as “the whole is *greater* than the sum of its parts.” Many contemporary approaches to improving education in school districts, however, seem to distort this principle to become “the whole is *equal* to the sum of its parts.” This distortion is implied by how school-based improvement advocates ignore the “whole system” and focus only on the “parts”; that is, they focus exclusively on improving education within individual schools and classrooms and ignore how those schools, classrooms, and academic and non-academic support functions are and must be interconnected to educate children. The unstated assumption seems to be that, if only enough parts are fixed, then the performance of the whole school system will improve. And, the implied operating principle of school-based improvement seems to be that the schools and classrooms are and should be independent of the whole system (sometimes the term “loosely coupled” is used to characterize this assumed independence). However, complexity theory tells us that when one part of a system is linked to other parts, a significant change in one part will succeed only if there are significant complementary changes in the connected parts.

Changes made in individual schools and programs are and must be linked to corresponding changes made to other schools and programs in a school system. This is an important principle because a child’s education is more than what he or she learns in a particular grade or level of schooling. His or her learning is the cumulative effect of P–12 learning (in a P–12 district), even if a child moves from one district to another. Furthermore,

* In a P–12 school district, a cluster is a high school and all the schools that feed students into that high school. In school districts organized as high school districts or elementary districts, the clusters would still contain the districts’ entire instructional program.

the quality of education that a child receives in any particular grade or level of schooling has a direct effect on his or her future learning. For example, studies (e.g., Sanders & Rivers, 1996) suggest that when children have two or three poor teachers in a row, those children continue to learn, but they never catch up to their peers who had better teachers. These learning deficits are a reflection of a systems principle called “upstream errors flow downstream.” In other words, mistakes that are made early in a work process (in teaching and learning at the elementary education level), if not identified and corrected, will flow downstream and create even greater problems later on in the work process (in teaching and learning at middle and secondary education levels). In systems, upstream errors always flow downstream.

So, it can be argued that if schools and classrooms in a school district are treated as if they are loosely coupled or relatively independent of each other, they should not be. Schools and classrooms should not be loosely coupled, because a child’s education requires interdependence among various parts of a school system. Since the education of a child requires interdependence among various parts of a school system, the school-based improvement strategy is insufficient, because it reinforces and sustains the disconnections between and among a school system’s parts; that is, it creates a lack of synergy (if not downright incompatibility) among schools and programs within the system. This fact explains why the promised improvements offered by school-based improvement advocates often have failed to improve teaching and learning throughout entire school systems; and where school-based improvement has created improvements, those changes created temporary pockets of excellence (in the schools that improved) while leaving pockets of mediocrity (in the schools that maintained average performance) and pockets of despair (in the schools that continued to fail) all within the same system.

Finally, another characteristic of complex systems is that if changes are made to a few parts of a system and not to others, the changed parts become incompatible with the remaining parts of the system. In response to this incompatibility, the unchanged parts apply significant pressure on the changed parts, and they force those changed parts to revert to their pre-change status; thereby enacting that famous French adage, “the more things change, the more they stay the same.” An example of this phenomenon is frequently observed in contemporary approaches to school-based improvement; for example, many wonderful school-based changes, such as the *Saturn School of Tomorrow* (Bennett & King, 1991), became incompatible with the rest of the school system, and they were ultimately forced to change back to their pre-change state.

Three Paradigm Shifts Are Required for Transformation

The literature on systemic change in organizations (e.g., Ackoff, 1974; Nevis, Lancourt, & Vassallo, 1996; Pasmore, 1988; Pava, 1983; Trist & Murray, 1993) suggests that change leaders need to consider simultaneously three inter-connected paradigm shifts to create and sustain transformational change. Duffy (2002, 2003) tailored these sets of changes for school system transformation (he calls them “change paths”). They are:

- *Paradigm shift 1:* The primary work processes—teaching and learning—must be transformed to a paradigm that is customized to learners’ individual needs and is focused on attainment of proficiencies (Reigeluth, 1994), and the supporting work processes must be transformed to best support the primary work processes. In addition, continuous improvement is needed as soon as the new paradigm is implemented. Duffy refers to this shift as *Path 1: transform the system’s core and supporting work processes.*
- *Paradigm shift 2:* The school system’s social infrastructure (e.g., organization culture, communication practices, job descriptions, reward systems, and so forth) must be transformed from a command-and-control organization design to a participatory organization design. Duffy refers to this shift as *Path 2: transform the system’s internal social infrastructure.*
- *Paradigm shift 3:* The relationship between the school system and its systemic environment must be transformed from an isolative and reactive stance by the school system to a collaborative and proactive stance. Duffy refers to this shift as *Path 3: transform the system’s relationship with its external environment.*

Although the three paradigm shifts (changes along all three change paths) must be made simultaneously, given the interdependencies among parts of a school system, changes in the teaching-learning process (the core work process that is part of paradigm shift 1) should drive the nature of the changes created for the other two paradigm shifts, especially for paradigm shift 2. Complementary changes for paradigm shifts 1 and 2 are important because, if changes are only made to the work processes and not to the social infrastructure, this strategic error can create situations where school systems have the most powerful teaching and learning system in the world, but their teachers are demotivated, dissatisfied, and unskilled and teachers experiencing these conditions will not and cannot use that powerful system in remarkable ways.

Finally, changes for paradigm shift 3 are required for gaining and maintaining external political support for a district’s transformation journey. Without this support,

change leaders will not be able to get the human, technical, and financial resources they need to launch and sustain their district's transformation. Further, the literature on organization effectiveness (e.g., Daft, 2006) tells us that to be effective an organization must have a positive, proactive relationship with its environment. Creating this kind of positive proactive relationship is one of the goals of paradigm shift 3.

The School District as the Preferred Unit of Change

Since the ultimate goal of transformational change is to transform an entire school system to a paradigm appropriate for the 21st Century, individual schools and classrooms are the inappropriate unit of change for achieving this goal. The appropriate unit of change for transformation is the whole school system.

Although a whole school district is the unit of change, we recognize that changing a whole system all at once is probably an impossible task. So, transformational change has to start somewhere inside the district and then spread throughout the entire system. Finding that ideal starting point for transformational change requires the application of a systems change principle called "leveraged emergent design" (Reigeluth, 2006a). This principle requires change leaders to find and start changing a part or parts of the system that can exert powerful leverage on unchanged parts of the system and thereby countervail the forces working to stop the change process and return the system to its pre-change state.

Starting with a few high-leverage changes can make the whole systemic change process considerably quicker and easier. From our perspective, the ideal high-leverage starting point is an academic cluster (a set of interconnected schools) that contains the district's entire instructional program. In larger districts with multiple high schools, there would be one academic cluster for each high school. In districts without a P-12 instructional program (e.g., in elementary districts), each cluster would still contain the district's entire instructional program and all age-levels it spans.

A support work cluster also needs to be formed for the central office functions and another support cluster for non-academic services, such as cafeteria services, transportation services, and building and grounds maintenance services. These clusters also engage in transformation activities because improving support work is a critical part of the transformation journey (as part of Paradigm shift 1: Transform core and supporting work processes, described above).

School System Transformation as a "Wicked Problem"

Because school districts are complex systems that must engage successfully in three paradigm shifts (described earlier) to create and sustain transforma-

tional change, transforming school systems is an example of what Rittel and Webber (1973) called a "wicked problem." A wicked problem has incomplete, contradictory, and changing requirements. Solutions to them are often difficult to create because of the complex interdependencies that created the problems in the first place; for example, while trying to solve a wicked problem, the solution for one of its aspects may reveal or create other, even more complex, problems.

Ackoff (1974) described wicked problems as "messes." He said, "Every problem interacts with other problems and is therefore part of a set of interrelated problems, a system of problems.... I choose to call such a system a mess" (pp. 20-21). Pava (1986) also commented on these kinds of problems. He said:

Ill-defined, complex problems often require systematic change in behavior and values. However, the uncertainty of such issues polarizes different stakeholders and impedes collaborative solutions. Traditional approaches to managing change are unable to deal with these situations, where both complexity and conflict are intensified (online document).

Bar-Yam (2004) tells us that there is no one way to solve wicked problems, and there are no "best practices" that apply to all situations. Any workable solution, Bar-Yam says, has to be related to the specific characteristics of the problem (p. 15). Yet, many contemporary school reform "best practice" models are heralded as "one-size-fits-all-and-all-you-have-to-do-is-replicate-it" approaches. Almost without exception, the replication of the "best approach" fails; for example, of the 22 school systems that received training from the Re-Inventing Schools Coalition (RISC) on how to replicate Alaska's Chugach School District's successful transformation that won them one of the first Baldrige quality awards in education, only three were able to succeed in replicating Chugach's success. Why? Because each school district has a unique set of characteristics and problem-sets, and replication of some other district's successful change effort predictably fails.

Instead of trying to replicate some other district's successful change effort, a school system needs to create its own unique solutions to its unique characteristics and problem-sets. Instead of trying to find and replicate a school reform model, they need to use a methodology that will help them identify *their* unique characteristics, explore *their* unique problem-sets, create an idealized vision for *their* future, and engage in a process of invention and design that will lead them to their idealized future.

Knowledge and Skill-Sets for Effective Change Leadership

Given the complexity of school system transformation, change leaders need special knowledge and skill-

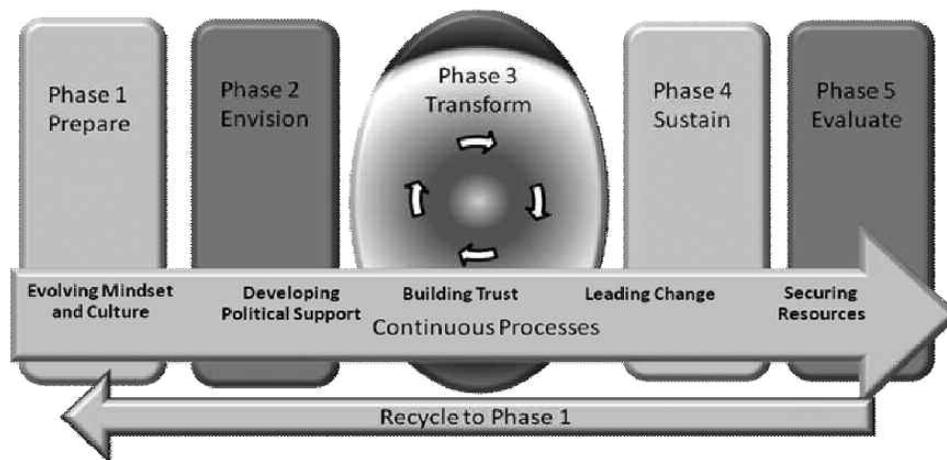


Figure 1. The School System Transformation (SST) Protocol.

sets to lead this kind of change. Duffy (2008) identifies these knowledge and skill-sets. He says change leaders need:

- a change vehicle (a specially designed methodology and set of tools for creating and sustaining transformational change);
- a map and compass (knowledge of systems theory, systems dynamics, complexity and chaos theory, and knowledge of what needs to change); and,
- superior change navigation skills that include:
 - o *mastery of awareness*—becoming skillful in collecting, analyzing, interpreting, and reporting need data (which push people toward change) and opportunity data (which draw people toward change);
 - o *mastery of intention*—becoming skillful in creating and communicating a compelling and emotionally powerful vision of an idealized future for a school system; and
 - o *mastery of methodology*—becoming skillful in using a methodology especially designed to create and sustain transformational change and the tools that are part of that methodology).

Given the confusion about the meaning of the term “systemic change,” the characteristics of school districts as complex systems, the three complementary paradigm shifts that must be made to create and sustain transformational change, the whole school system as the preferred unit of change, the nature of transformational change as a “wicked problem,” and the knowledge and skill-sets required for effective change leadership, change leaders who want to transform their school systems need a new methodology especially designed in response to this complexity so they can create and sustain transformational paradigm change—this new methodology is the *School System Transformation (SST) Protocol*.

The School System Transformation (SST) Protocol

Working without knowledge of the other’s work, we each designed and constructed a methodology to create and sustain transformational change in school districts. Both of us drew the concepts and principles that formed the framework of our methodologies from the same literature on systems thinking, systemic change, complexity and chaos theory, organization theory and design, organization development, and learning organizations. Reigeluth’s (Jenlink, Reigeluth, Carr, & Nelson, 1996; Reigeluth, 2006b) methodology was called the *Guidance System for Transforming Education (GSTE)*, and Duffy’s (2001) methodology was called *Step-Up-To-Excellence (SUTE)* (originally called *Knowledge Work Supervision* in Duffy, Rogerson, & Blick, 2000).

Once we learned of each other’s work, we noticed the similarities and differences, and we decided that we should blend our methodologies to design a new hybrid methodology. That hybrid methodology is the *School System Transformation (SST) Protocol*, and it is currently being used to facilitate the transformation of the Indianapolis Metropolitan School District of Decatur Township, Indiana. The SST Protocol is also part of the new nationwide *FutureMinds: Transforming American School Systems* initiative launched by the Association for Educational Communications and Technology (see our article in the previous issue of this magazine).

The SST Protocol Framework

The SST Protocol was designed to create and sustain transformational change in school districts. Figure 1 illustrates the protocol.

The logic used to design the SST Protocol is built on the following premises (these elements of the protocol were described in the first article in this series that appeared in the last edition of this journal):

Table 1. Eighteen continuous processes in the SST Protocol.

1. Evaluate and improve the change process.	10. Develop group-process and team-building skills.
2. Build and maintain political support.	11. Build team spirit.
3. Sustain motivation.	12. Engage in self-disclosure.
4. Develop and sustain appropriate leadership.	13. Engage in reflection.
5. Build and maintain trust.	14. Develop design skills.
6. Evolve mindset and culture.	15. Communicate with stakeholders (two-way).
7. Periodically secure necessary resources.	16. Build and evolve community.
8. Develop skills in systems thinking.	17. Foster organizational learning.
9. Periodically and appropriately allocate necessary resources.	18. Build an organizational memory.

- Paradigm change requires mindset change,
 - o which requires broad stakeholder ownership,
 - o which requires participatory leadership and consensus-based decision making.
- Paradigm change also requires invention,
 - o which requires idealized design, systems thinking, continual learning, and
 - o an emergent design process that starts with high leverage changes.
- Paradigm change requires changing all parts of the system, including the district’s core and supporting work processes (instructional system, assessment system, record-keeping system, central office functions, transportation services, cafeteria services, and so on), its internal social infrastructure (e.g., rules, roles, and relationships; organization culture; organization design; reward system, and so forth); and its relationships with its external environment.
- Paradigm change also requires using a substantially different approach to creating and sustaining change.

The SST Protocol has some sequential elements and some elements that need to be addressed continuously throughout the transformation process. The sequential elements fall into five phases. Each phase has several steps and each step has multiple tasks and activities. Flowing continuously throughout the protocol is an important collection of eighteen “continuous processes” (from Jenlink *et al.*, 1996), some of which are represented in Figure 1 in the large arrow that transects the five phases. The eighteen continuous processes are displayed in Table 1.

The SST Protocol also uses a wide range of effective

tools for helping mindsets to evolve, building consensus, engaging external stakeholders, developing internal commitment to change, visioning, and so on.

The five phases in the protocol should not be thought of as a lockstep sequence. Instead, they should be perceived as a set of flowing activities that converge, diverge, and backflow from time to time, and do so repeatedly until the entire system is transformed. Further, transformational change is not a one-time event. It should be a cyclical lifelong journey with periods of continuous improvement between periods of transformational change. The cyclical nature of transformational change is built into the SST Protocol and is portrayed as the arrow in Figure 1 with the words “Recycle to Phase 1.” This level of complexity was deliberately built into the design of the protocol because we wanted the protocol to align with the complexity of school systems and their external environments (a principle that is derived from complexity theory).

The Five Phases

Phase 1: Prepare. Preparing a system for transformational change is absolutely critical to the success of a transformation journey. Kotter (1996) identified eight reasons for failed transformational change. Six of those eight reasons are linked to inadequate or short-circuited preparation of the system.

Preparation activities include developing a district’s capacity to engage in transformational change. Our definition of capacity includes the existence or confirmed emergence of specific conditions prior to launching a systemic transformation journey. Duffy (2008) identified those conditions as:

- senior leaders who act on the basis of personal courage, passion, and vision—not on the basis of fear, self-survival, or self-interest;
- leaders and followers who are willing and able to break or circumvent rules to create paradigm change—not those who are rule bound;
- senior leaders who conceive of their districts as whole systems—not as a confederation of individual schools and programs;
- leaders and followers who have a clear view of the opportunities that systemic transformation offers them—not a view of “We can’t do this because . . .”;
- leaders and followers who possess the professional intellect, change-minded attitudes, and change-navigation skills to create transformational change in their districts—not people without an inkling about the requirements of navigating transformational change; and,
- human, technical, and financial resources to sustain a transformation journey over five to seven years (large-scale change can take this long)—not resources “stolen” from successful

programs to pay for transformational change.

Preparation activities also focus on developing internal and external political support for transformational change, identifying sources of funding to support transformational change, and creating change management structures and processes (e.g., organizing the district into clusters of schools, and chartering and training change leadership teams).

The length of time required to complete Phase 1 will vary from district to district and will be influenced by a district's prior experience with change, the size of the district, and the demographic complexity of the district's external environment.

Phase 2: Envision. In this phase, change leaders design and implement a collection of transformation activities to help educators in the system envision an idealized future for their school district. A critically important early task in this phase is to engage educators in activities especially designed to help them evolve their mindsets about the nature of teaching and learning in the 21st Century Information Age. The refined mindsets that emerge from these educational activities are absolutely essential for the success of a district's transformation journey.

Following the activities for helping mindsets to evolve, change leaders then design and implement a special large-group event for key external stakeholders (a Community Engagement Conference) and one for faculty and staff (a System Engagement Conference). These events are designed using tested principles for effectively engaging large groups of people in productive discussions about the future of their school system. The outcomes of both events provide a district's change leaders with the data they need to develop a Framework of Ideal Beliefs for the district that will guide the transformation of their system.

Phase 3: Transform. Once the Envision Phase is near completion, the change process then flows into a set of transformation activities. The early transformation activities occur primarily within clusters of interconnected schools within the system, and later in this step faculty and staff in individual schools and support units engage in special transformation activities.

Examples of some of the transformation activities that occur during Phase 3 include:

- aligning the district's transformation goals and Framework of Ideal Beliefs with external expectations;
- designing new instructional and managerial paradigms for the school system;
- training school design teams to develop their capacity to engage in systemic transformation; and
- removing old programs, policies, and practices to make room for the new ones required by the new instructional and managerial paradigms (a

principle derived from chaos theory; e.g., see Pascale, Milleman, & Gioja, 2000).

Phase 4: Sustain. One of the perplexing and enduring problems associated with creating change in school systems is the challenge of sustaining those changes. Sustaining change requires a set of specific activities designed to provide educators with formative evaluation data about the effectiveness of the transformation process and outcomes, retooling the district's reward system to reinforce desirable changes, institutionalizing the change process so it becomes a permanent part of the district's operations, and creating and rewarding strategic alignment among the various schools, programs, tasks, and activities within the school system. It is also helpful if school boards develop policies to protect the changes from the vagaries linked to the revolving door on the superintendent's office (i.e., many districts have high turnover in the superintendent's position, and each new superintendent often sweeps out his or her predecessor's changes and supplants those with his or her own change agenda).

Sustaining change also requires staff development and training to help educators continue to learn new knowledge and skills that are required by the changes. Then, educators need time to develop personal mastery in applying their new knowledge and skills. As educators engage in these learning activities they will predictably move through a learning curve.

Without exception, the first movement in a learning curve is always down. This means that as educators begin learning new knowledge and skills, they will not be proficient in applying the knowledge and skills. Eventually, as they continue to learn and practice the new knowledge and skills, the downward slope of the learning curve will bottom-out and the educators will begin to increase their proficiency and move upward toward personal mastery of the new knowledge and skills. Because of the "first down, then up" learning curve, it is very important to design staff development activities that inform educators about that learning curve and to help them understand the emotional cycle of change that is inextricably connected to that learning experience (e.g., as people start applying new knowledge and skill, they will not be proficient, and this experience often stimulates feelings of frustration, sadness, or anger).

Phase 5: Evaluate. Principles of formative evaluation are used in Phase 4 to help educators sustain desirable changes in their system. In Phase 5, educators apply principles of summative evaluation to assess the system's post-transformation performance.

There are several summative evaluation models in the field of education. One that is particularly suitable to the task of evaluating transformational change is Stufflebeam's (2000) Context Inputs Process Product

(CIPP) model. This model has elements of systems thinking built into it, which makes it appropriate for evaluating transformational change.

It is insufficient simply to conduct a summative evaluation of a transformation journey. The results of the evaluation must be reported to key external stakeholders and to faculty and staff. This need requires change leaders to use principles of strategic communication (Duffy, 2008, in press; Duffy & Chance, 2007). Keeping the results secret is a dangerous political strategy that almost always backfires.

Conclusion

Our society has transformed into what sociologists call the "Information Age." Most of America's institutions are adjusting to the requirements of the Information Age.

The one institution lagging significantly behind in this transformation is education. School systems were designed for success in the preceding age—the Industrial Age. That design, which is focused on sorting students, is inappropriate for the requirements of the Information Age, and this mismatch between organization design and environmental demands is, we believe, causing many of the teaching-learning problems associated with schooling in America (e.g., the achievement gap and low performance on achievement tests). Further, Bar-Yam (2004), drawing from complexity theory, tells us that systems can only be effective when their design matches the complexity of their external environment.

School districts are complex systems. Therefore, improving the performance of school districts requires change leaders to use principles of systems theory, systemic change, chaos and complexity theory, and organization theory and design to transform districts so they can educate students for success in the 21st Century. However, the dominant and stunningly persistent approach to improving education—the school-based improvement paradigm—does not and cannot transform entire school systems. Instead, that approach unintentionally (we hope not purposefully) reinforces the old Industrial Age design of school systems by tweaking parts of the system (individual schools and programs) and maintaining the overall structure of the old paradigm by never transforming the core work (the teaching and learning process).

Tweaking the parts of a school system is a failed change strategy if transformational change is needed. A methodology especially designed to create and sustain transformational change in school districts is the *School System Transformation Protocol*.

Epilogue

The ideas presented in this article, and in the full series of which it is a part, represent a lot of innovative

thinking about how to create and sustain transformational change in school districts. Almost without fail, when these ideas are shared with audiences, at least one person demands to know the results of applying these ideas in school districts.

Innovative ideas, by definition, are not being widely used and therefore reporting substantive results is difficult to do. To produce substantive results from innovative ideas, educators must begin using the ideas. People who use innovative ideas early-on are called "early adopters." It takes significant courage, passion, and vision to be an early adopter of a transformational change methodology because trying something new is risky business.

Fortunately, there are early adopters in the field of education that are using the principles of systems theory, systemic change, complexity and chaos theory, organization development, and learning organizations. For example, one of us (Reigeluth) is facilitating the transformation of the Indianapolis Metropolitan School District of Decatur Township in Indiana (http://www.indiana.edu/~syschang/decatour/change_process.html).

Yet, despite the need for transformational change in school districts and despite the efforts of the early adopters to lead this kind of change, there is a lingering question in the dimly lit interstice between the articulation of an idealized vision for the future of schooling in America and the realization of that vision. The question is "how do we do this?" A more important question, however, is "why should we do this?" The series in which this article is a part answers both questions. □

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Q & A with Ed Tech Leaders

Interview with Michael G. Moore

Michael F. Shaughnessy
Susan M. Fulgham

From radios to today's present technology, **Michael G. Moore** shares his history and vision of distance education. He states that challenges in distance education revolve around a "changing allocation of resources," where long-term success is defined through quality delivery of the "knowledge-creation" process. Moore summarizes his efforts in working with distance education in various countries and his work with the Global Distance Education Network. He presents the desired direction of research in the field for future scholars, but reminds us that changes in pedagogy and policy offer the best overall picture of the future of distance education.

1. Your name is almost inextricably linked with distance learning. How did you first get started in distance education?

My early years were spent in East Africa, where I worked from 1963 to 1970. I found teaching courses in my academic subject, which was economics, to be very unsatisfactory and looked for ways of becoming involved with the learning needs of ordinary people in such areas as health, farming methods, setting up credit unions, and so on. These people were living in villages linked by poor roads, with no telephones, and thus had no access to sources of knowledge. However, I noticed that one means of communication was quite common, and that was the battery powered

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