

What is Systems Theory?

Daniel Pascoe, M Div, is Associate Director of the Indiana University Career Development Center. He is also a doctoral student in the Instructional Systems Technology Department at Indiana University, Bloomington. His research interests include systems theory and career development. He can be contacted at dpascoe@indiana.edu.

- Bertalanffy, L.V. (1968). *General system theory*. New York: George Braziller.
- Banathy, B.H. (1991). *Systems design of education: A journey to create the future*. Englewood Cliffs, NJ: Educational Technology Publications.
- Banathy, B.H. (1992). *A systems view of education. Concepts and principles for effective practice*. Englewood cliffs, NJ: Educational Technology Publications.
- Reigeluth, C.M. (1999). *Instructional-design theories and models. A new paradigm of instructional theory*. Volume II. Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday.

Systems Thinking for AECT Members

Brian Beabout is a doctoral candidate in the Instructional Systems program at Penn State University. His research interests include urban school reform and applications of critical theory to educational leadership. He can be contacted at bbeabout@psu.edu.

- Ackoff, R. (1974). *Redesigning the Future*. New York: John Wiley & Sons.
- Banathy, B. (1992). *A Systems View of Education*. Englewood Cliffs, NJ: Educational Technology Publications.
- Capra, B. A. (1990). *Mindwalk*. USA.
- Hutchins, C. L. (1996). *Systemic Thinking: Solving Complex Problems*. Aurora, CO: Professional Development Systems.
- Reigeluth, C. M. (1993). Principles of Educational Systems Design. *International Journal of Educational Research*, 19(2), 117-131.

Systemic Change and Systems Design

William Watson is a lecturer in Computer and Information Technology at Indiana University - Purdue University Indianapolis and a doctoral student in the Instructional Systems Technology Department at Indiana University, Bloomington. His research interests include the design of instructional video games, e-learning, and systemic change in education. He can be contacted at wwatson@iupui.edu.

- Banathy, B.H. (1991). *Systems design of education: A journey to create the future*. Englewood Cliffs, New Jersey: Educational Technology Publications.
- Banathy, B.H. (1996). *Designing social systems in a changing world*. New York: Plenum Press.
- Reigeluth, C. M. (1994). The imperative for systemic change. In C. M. Reigeluth, & R. J. Garfinkle (Eds.), *Systemic change in education* (pp. 3-11). Englewood Cliffs, NJ: Educational Technology Publications
- Squire, K and Reigeluth, C.M. (2000). The many faces of systemic change. *Educational Horizons* (Spring).
- Toffler, A. (1980). *The third wave*. New York: Bantam Books.

Systemic Change as an Anchor Point for Professional Ethics and Action

Stephanie Moore, Ph.D., is currently the Assessment Coordinator for Colorado Reading First at the Colorado Department of Education in Denver, CO. Her research interests include professional ethics in educational technology, history and philosophy of technology, systemic assessment and evaluation, systemic change and related issues. She can be contacted at stephanie@hyperperformer.com.

- Banathy, B.H. (1994). Designing educational systems: Creating our future in a changing world. In C. Reigeluth & R. Garfinkle (Eds.), *Systemic change in education* (pp. 27-34). Englewood Cliffs, NJ: Educational Technology Publications.

- Barbour, I. (1993). *Ethics in an age of technology: The Gifford Lectures, Volume Two*. San Francisco: Harper Collins.
- Brethower, D. (2005). Yes we can: A rejoinder to Don Winiecke's rejoinder about saving the world with HPT. *Performance Improvement Journal*, 44(2): 19-25.
- Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920*. New York: Teachers College Press.
- Cuban, L. (2003). *Oversold and underused: Computers in the classroom, 1980-2000*. Cambridge, MA: Harvard University Press.
- Davis, M. (1999). *Ethics and the university*. London: Routledge.
- Dean, P. J. (1999). The relevance of standards and ethics for the human performance technology profession. In H. Stolovitch and E. Keeps (Eds.), *Handbook of Human Performance Technology* (2nd ed., pp. 698-712). San Francisco: Jossey-Bass.
- Frankel, M. (1989). Professional codes: Why, how, and with what impact? *Journal of Business Ethics*, 8, 109-115.
- Guerra, I. (2001). *A study to identify key competencies for performance improvement professionals*. Unpublished doctoral dissertation. Florida State University.
- Healy, J. (1990). *Endangered minds: Why our children don't think*. New York: Simon & Schuster.
- Healy, J. (1999). *Failure to connect: How computers affect our children's minds — and what we can do about it*. New York: Simon & Schuster.
- Kaufman, R. (2000b). *Mega planning: Practical tools for organizational success*. Thousand Oaks, CA: Sage Publications.
- Kaufman, R. & Watkins, R. (2000). Getting serious about results and payoffs: We are what we say, do, and deliver. *Performance Improvement* 39(4), 23-32.
- Moore, S. (2005). *The social impact of a profession: An analysis of factors influencing ethics and the teaching of social responsibility in educational technology programs*. Unpublished doctoral dissertation. University of Northern Colorado.
- Persig, R. (2000). *Zen and the art of motorcycle maintenance: An inquiry into values*. New York: HarperCollins.
- Plato. (1990). *Phaedrus*. In Patricia Bizzell and Bruce Herzberg (Eds.), *The Rhetorical Tradition: Readings from Classical Times to the Present* (pp. 113-143). Boston: Bedford Books.
- Scharff, R., & Dusek, V. (Eds.). (2003). *Philosophy of technology: The technological condition, an anthology*. Malden, MA: Blackwell Publishing.

Section 3

Influences of Suprasystems on Systemic Change

General Influences of Suprasystems on Systemic Change

Charles M. Reigeluth

Section 2 of this issue addressed the nature of, and need for, paradigm change in our systems of education and training as we evolve from the industrial age into the information age. That section also identified systems thinking's emphasis on understanding relationships of all kinds as essential to the success of any systemic change effort. Those relationships include ones between a system and its suprasystem(s), its peer systems, its systemic environment in general and its external stakeholders, as well as relationships within the system — relationships among its subsystems and its causal dynamics. This blurb

addresses the powerful influences of a suprasystem on any system which we may want to help engage in systemic change.

It is important to understand that system relationships can range from very tight coupling to very loose coupling, based on the degree of independence the system has from its suprasystem(s). For example, a store that is owned by one national chain may have all of its policies, products and procedures dictated by the national headquarters. On the other hand, a store that is owned by another national chain may have great independence to decide on its own policies, products and procedures. Similarly, a school in one school district may have its policies, curriculum and programs (or methods) dictated by the central office, while a school in another district may have considerable independence in making its own decisions.

The tighter the coupling between a system and its suprasystem, the more a systemic change effort must bring about changes in the suprasystem, as well as the system of interest. In the current industrial-age paradigm of education, a school and its school district (central office) tend to have a relatively tight coupling. This explains why many school-wide reform efforts that have attempted fundamental changes have consistently reverted back to the industrial-age paradigm over time, such as the participating schools in the Eight-Year Study, the Dalton Plan and the High Schools of Tomorrow (Tyack, 1995) and more recently the Saturn School of Tomorrow (Bennett, 1991). This is why a number of systemic change experts advocate that systemic change in education must be district-wide rather than just school-wide (Duffy, 2000; Duffy, 2002; Jenlink, 1998).

Of course, school districts are also influenced by their state educational system (primarily the state department of education) and the federal system (primarily the U.S. Department of Education and the various laws it administers, such as No Child Left Behind). While these suprasystems are more loosely coupled to an individual school, they can still exert powerful influences over a school's ability to transform to an information-age, learner-centered paradigm of education in which learners are no longer "prisoners of time" (<http://www.ed.gov/pubs/PrisonersOfTime/index.html>). Similarly, the community in which a school district is located can have a powerful influence over the success of a systemic change effort.

In higher education, a university is typically loosely coupled with its suprasystems, but its various schools or colleges tend to be tightly coupled with the university, as are departments with their respective schools or colleges. Similarly, in the corporate sector, a training department is typically tightly coupled with the company management system. Of course, the strength of coupling can vary considerably within any type of system or context area and therefore needs to be assessed.

The central point of this discussion is that relationships between a system and its suprasystem can have a large impact on the success of a systemic change effort. Therefore, it is important to identify both the nature and strength of the relationships at the onset of an effort, and to plan

for ways both to capitalize on the facilitative aspects and minimize the inhibitory aspects of that relationship. It is a general tenet among systems theorists that, if you want to help a system to change, you have to also foster supportive changes in its suprasystem (Banathy, 1991), or at very least seek exclusions, waivers or other arrangements that will remove impediments to systemic change. The concept of coevolution in systems theory indicates that a system and its suprasystem must always change together (Banathy, 1996). If one evolves to be incompatible with the other, the resulting evolutionary imbalance puts both at peril, and the tighter the coupling, the greater the peril.

The remaining blurbs in this section discuss the influences of suprasystems and their policies on systemic change efforts in public K-12 education in the United States and Korea.

Influences of Federal Policy on Systemic Change in K-12 Education

Susan Patrick

Uncle Sam, tear down the walls of the education system; a revolution is underway! The federal government can be a strong facilitator for systemic change. The Office of Educational Technology, the Office of Innovation and Improvement, Star Schools and Enhancing Education Through Technology programs provide numerous examples of the federal government facilitating fundamental change. For example, the Florida Virtual School program was initiated through support from a federal grant and solid state-level leadership. The federal government facilitated systemic change by: 1) creating a report on the design of an innovative school to help guide education leadership, "Prisoners of Time" and 2) providing funding for the new model of virtual schooling. This brought student-centered, any time, any place, any path, any pace learning to life. The result — the Florida Virtual School is now providing online courses to thousands of students and is a nationally-recognized example, highlighted in the National Education Technology Plan 2004, "Toward a New Golden Age In American Education: How the Internet, the Law and Today's Students Are Revolutionizing Expectations."

Despite those successes, the federal government constrains systemic change by focusing on the current system to the exclusion of providing vision, planning and implementation metrics for what the system should be. In 1994, the "Prisoners of Time" report was released, citing:

By far the most important part of this Commission's charge relates not to time but to student learning. ... As witnesses repeatedly told the Commission, there is no point to adding more time to today's schools if it is used in the same way. We must use time in new, different, and better ways.

Twelve years later, federal programs are still largely continuing to fund models that maintain our students as

prisoners of time in their schools. Federal policies that focus funding on research-based practices exclude sorely needed support for developing and improving learner-centered models that use time and technology in new and better ways.

The federal government should stop funding antiquated, time-based models of education and instead fund new models that focus on learning, rather than on sorting students. Federal funding should work as a catalyst to move to a powerful new paradigm, not a crutch to prolong an obsolete one. Until we change the paradigm of education, adding on innovations will only create additional tensions in an outdated, overworked system. The federal government's primary role should be to sponsor research on new paradigms of education at all levels. This should include:

- Drive a vision for systemic change. This begins with a serious understanding of what systemic change is, how it happens and what can be done to facilitate it.
- Convene a wide array of stakeholders to connect, collaborate and think about how instruction can best foster individual student growth and how schools of the 21st century might look with blended models of online learning and information technologies imbedded in learner-centered instruction.
- Support research and development (R&D) on a new paradigm of assessment whose summative component produces an "inventory of attainments" for each student rather than norm-based grades, and whose formative component provides information to guide instruction, and that thereby better informs students, parents, teachers and school leaders of how successful their programs are.
- Support R&D on new models of curriculum and assessment focused on 21st century needs and skills, such as those identified by the SCANS report.
- Support R&D on new forms of instruction that freed from the shackles of time and customized to each student's needs and talents.
- Require applications for federal grants to illustrate how they move toward transformation and systemic redesign.
- Train teachers and administrators for the information age. This entails fostering a major shift in mindset or worldview about education, as well as training in the use of specific technologies and learner-centered methods of instruction. There needs to be a very different physical concept of how a modern school works and looks.

Using federal investments to support these kinds of activities would do much to facilitate dramatic improvements in meeting the needs of students and their communities in the information age. We are addicted to a model of living history in our own memories of what school looks like. Education needs its own twelve-step program to shake that addiction. The federal government needs to take a deep dose of systems theory and begin to redesign schools into the future of our modern world.

Influences of NCLB on K-12 Systemic Educational Reform

Gerardo M. González

Growing concerns about America's ability to compete globally led Republicans and Democrats alike to rally behind what became known as the No Child Left Behind Act of 2001. The central goal of NCLB is to close the achievement gap between high and low-performing children, especially gaps between minority and non-minority students and between disadvantaged children and their more advantaged peers, to ensure that every child is proficient in reading, math and science by 2014. To achieve this goal, the NCLB requires a series of assessment and accountability measures designed to increase the number of states adopting subject-area content standards and tests linked to those standards. If students in any of a number of demographic and income categories fail to make adequate yearly progress (AYP) toward proficiency in the subjects tested, the schools and school districts they attend must institute corrective measures or face sanctions, including the loss of Federal Title I funds.

While enjoying significant bipartisan support initially, as it approaches the first reauthorization deadline of its 12-year timeline the NCLB has come under increasing criticism by both federal and state officials. Though the first step in the process of reauthorization will be a thorough assessment to determine what portions of the law might need modification, lawmakers already have introduced scores of legislative changes and several states have launched legal challenges claiming the law is an unfunded mandate and an intrusion into state rights. Writing for the *TC Record*, Sunderman and Kim (2005) identified three factors contributing to the growing dissatisfaction with the law, namely the Administration's approach to federalism, the states' limited capacity to meet the law's requirements and the fiscal constraints facing state governments. In 2006, for example, the federal appropriation of \$12.8 billion for Title I school districts is only slightly more than half the NCLB authorized amount of \$22.8 billion.

In addition to the national criticisms about the political, capacity and resource implications of NCLB, some educators have also expressed concern that the emphasis on standardized testing to measure results has led to a narrowing of the curriculum and "teaching to the test" at the expense of other more learner-centered forms of teaching. Such a consequence is often seen as a barrier to an information-age paradigm of education where a student can learn at his or her own pace and results are measured by attainment of individualized, performance-based knowledge. Others argue that an absolute standard of proficiency and disaggregating AYP test results are necessary to measure progress toward the NCLB goal of having every child achieve at high levels in core subjects. An emerging compromise position approved by the U.S. Department of Education for piloting in several states is the "value-added" approach to measuring knowledge gains.

Though NCLB is silent on the forms of instruction needed to achieve these goals, it is clear that Congress intended for schools and school systems to adopt “scientifically-based” practices and be held accountable for results.

In a ten-year examination of the standards-based movement upon which NCLB is based, *Education Week* concluded that to date the results are both heartening and sobering (*Education Week*, 2006). For example, through a series of analyses using NAEP data, the report concluded that there was a positive relationship between states’ efforts to implement standards-based reforms and gains in student achievement. Improvements for math in grades 4 and 8 were statistically significant, while more modest, but positive, effects emerged for reading. Moreover, after controlling for states’ initial NAEP performance, preliminary analyses revealed no relationship between state resource and equity indicators. In conclusion, *Education Week* suggested that, while standards-based education and its implementation are far from perfect, they can contribute to improvement in American schools.

Clearly, NCLB is having a transformative effect on the nation’s educational landscape. The number of states embracing content standards and other provisions of NCLB is steadily increasing, and early results of student achievement measures are showing modest progress among all demographic groups. Many questions about the law’s impact still remain, however. Among others, the issue of whether NCLB enhances or constrains performance-based knowledge not generally measured by standardized tests remains an unanswered question. Whether reauthorization would lead to greater flexibility and a renewed commitment to provide the support needed to sustain systemic school reform also remains open to debate. Regardless, NCLB has sharpened the focus on the need for data to inform educational decisions and has presented educational practitioners and scholars with an unprecedented opportunity to impact national policy through research.

Influences of State Policy on Systemic Change in K-12 Education

Kathy Christie

State policies can have a profound impact on facilitating or impeding systemic change to learner-centered, customized education on the district and school levels. This blurb identifies a few such policies that can strongly influence such systemic change.

Time-based vs. competency-based

Students today are largely permitted to progress only by meeting seat-time requirements, which means that students who learn faster than average are expected to sit through a class for longer than necessary, while students who learn slower than average are penalized for not

learning the required information within an arbitrarily set time limit.

States could facilitate the transformation to customized education by allowing students to test out of courses and to make course completion contingent on demonstration of competency. For example, Utah passed a bill in 2004 (<http://www.le.state.ut.us/~code/TITLE53A/htm/53A01020.htm>) that requires the state board to set high school graduation requirements that use competency-based standards and assessments. The legislature defined competency as “a demonstrable acquisition of a specified knowledge, skill, or ability that has been organized into a hierarchical arrangement leading to higher levels of knowledge, skill, or ability.” The bill also defines competency-based education as “an education approach that requires students to acquire a competency and includes a classroom structure and operation that aid and facilitate the acquisition of specified competencies on an individual basis wherein students are allowed to master and demonstrate competencies as fast as they are able.” Gain score is defined as “the measured difference of a student’s score at the beginning and end of a time period.” The state board is required to assist school districts and charter schools to develop and implement competency-based education and to use gain scores.

Cultivate students’ strengths

Just as some students have stronger skills than others, students may have strengths in some academic areas, while having difficulty in others. Truly customized education would take this into account while allowing the student to progress. State policies can foster systemic change by providing options on high school exit exams that allow for demonstrated proficiency in all areas but one, or that allow students to provide proof of their understanding in an alternative way. For example, Maryland requires passage of end-of-course assessments in four areas for graduation. Beginning with the class of 2009, students may meet the requirement by either (1) achieving the passing scores previously approved; or (2) meeting a minimum score on each test that is lower than the previously set passing score and achieving a combined score on all four exams that is equal to the sum of the previously approved passing scores. So students who cannot do well on one or more tests may compensate by exceeding passing scores on other tests.

Data to customize learning

Correctly collected and applied student data can help meet individual students’ needs. State policies can facilitate this transformation by (1) providing sufficient state support for data systems that allow teachers direct, easy access to real-time assessment results, (2) providing support for common technology systems that meet specified components of student information systems (see: <http://www.ecs.org/html/IssueSection.asp?issueid=2&s=Other> and <http://www.ecs.org/html/issue.asp?issueid=2&subIsueID=91>), (3) providing support for computer-adaptive assessments that save time and allow for more accurate above-grade and below-grade specificity and that allow instruction to build on student strengths rather than

targeting deficits, (4) providing support for training in collecting and using data correctly (for principals, teachers, support teams) and (5) providing support for intervention specialists to assist students who are behind. In contrast, state policies can impede such transformation by: (1) requiring standards that are not subject to review and modification, (2) mandating assessments that take too much time away from instruction and (3) providing insufficient state support for classroom materials and supplies (see the ECS issue site on assessment: <http://www.ecs.org/html/issue.asp?issueid=12>).

Other policies

Other state policies to foster systemic change in school districts include: (1) ensure that students are not locked into instructional tracks, (2) provide incentives for immediate intervention services, (3) provide support for alternatives that allow and encourage acceleration of student learning, particularly for those students not performing at grade level and (4) support professional development and job redesign (with the emphasis on instruction) for principals. For example, see “The First Ring Leadership Academy” (at <http://www.ecs.org/clearinghouse/65/66/6566.pdf>). This brief, supported by MetLife Foundation, examines a leadership academy that has achieved remarkable success with the “homegrown” approach to school leadership preparation in an area with challenges traditionally faced by inner-city districts.

Influences of Charter School Policy on Systemic Change in K-12 Education

Irene Brock

Forty-one states and the District of Columbia now have charter school laws, according to The Center for Education Reform, <http://www.edreform.com> (January, 2006). These pieces of legislation have allowed nearly 3,600 charter schools to open in the U.S. (U.S. Charter Schools, <http://www.uscharterschools.org>, January 2006). The charter school movement is clearly enabling many students, parents and teachers to seek another avenue to meet needs that are unmet by traditional public schools.

Because of the freedoms that charter schools have from regulations, one might expect to find radically different curricular, pedagogical and organizational designs in these schools that are unavailable in traditional schools. Upon inspection, however, it is readily evident that charter schools tend to look curiously like traditional public schools, with an occasional magnet-school-like program dotting the charter landscape. If a major intent in the launch of the charter school movement was to enable and foster innovative educational designs for the information age, why is there so little of it? Does the opportunity not genuinely exist?

The most accurate answer is, “It depends.” A quick analysis of the collective body of states’ charter laws revealed

that there are several supportive factors. Charter schools are self-governing and free to design their own curricula, instructional approaches, hours of operation and student grouping structures. There are typically start-up funds and technical services available. In some states, the public per-pupil funding flows directly from the state to the school. What, then, is impeding systemic change?

If we assume that learning in the information age means discovery and development of one’s strengths, interests, aptitudes and ambitions, as well as continuously enlarging and expanding the skills and tools of learning and advancing the ability to think and problem-solve at increasingly complex levels, then we now have radically different purposes and goals, and we need radically different school structures to achieve them — structures that are customized to individual student needs. Yet state charter laws require charter school students to achieve the same standards adopted for all public schools, and they must be evaluated by the same state-specified standardized test. Worse, within those standards are specific grade-level standards and indicators, forcing all students to learn the same things at the same time and pace. There is no acknowledgement of the decades of research demonstrating that the learning rate, mode, pathways and purpose of students vary dramatically. Being limited to the same set of academic expectations and timelines set for regular public schools, charter schools will never be able to produce the needed transformation to truly learner-centered, customized education for a society in which knowledge work has replaced most manual labor.

Will charter schools get us where we need to go in the information age? It’s not likely. While they are granted various freedoms lacking in other public schools, in no state are charter schools currently free from the two controls that matter most — mandated state standards and assessment systems. Very few people have the expertise to design schools that meet the demands of this industrial-age paradigm and that of the information age simultaneously. State legislators and other officials must relinquish these two controls before charter schools will be able to change systemically to a more effective and appropriate paradigm of education.

Do charter schools hold any promise for systemic change? The major obstacle is that those who believe in the promise of charter schools have yet to realize that the most significant problem with current schools is not so much the schools themselves, but the paradigm, including the nature of the broader administrative and governance systems in which they must function. The charter school concept does hold promise, but it cannot fulfill its potential to produce the systemic change needed to move public education into an information-age paradigm until state legislatures recognize and are willing to act upon at least these five things: 1) that better teachers, standards, curricula, assessments and schools are not the answer, while a new and different paradigm is; 2) that more than a decade of research informs us about how young humans learn best; 3) that more time, money and facilitative resources are required for organiz-

ers to design an information-age paradigm of schools; 4) that teachers and parents really can make good decisions about the educational needs of their students and 5) that there are no quick fixes to a quality educational system appropriate for life in the Information Age.

State leaders of all stripes must be far-sighted and strong enough to weather the short-term storms necessary to produce the substantial long-term gain in learning that charter schools could achieve.

Influences of National Policy on K-12 Education in an Asian Country: The Korean Case

Hongsoo Lee

The Korean educational system

The current education system in Korea is much more centralized than in the United States. It operates in a top-down manner from the Ministry of Education (MOE) to each of the provincial offices of education, then to principals, to teachers and finally to students. The system has produced graduates who are not well suited to the challenges of today's fast-paced information society.

The suprasystem's impact on the schools

The policy-makers in the MOE recognize the need to provide students with higher problem solving abilities and foster creative and critical thinking for their future work and life. Consequently, the MOE launched various educational reform efforts around 1997. However, the speed of change in the schools seems frustratingly slow, due to the absence of substantial support from the government. Without practical support from the top, it is impossible to change a centralized system which means that the role of suprasystems is very important in systemic change.

Change from the top

When government officials want to change on the national level, changes do not always happen in all schools. Because of the importance of stakeholders' mindsets and the required resources, changes might not happen even on the top level. Let's look at the experience of the Korean educational system. To prepare for the information-based and globalization era, the MOE has launched various reform efforts. For example, the MOE has set forth a new national curriculum focusing on learner-centered education and distribution of multimedia hardware and software to schools. The curriculum has emphasized constructivist inquiry and cooperative learning as teaching approaches and performance-based, authentic portfolios as assessment approaches. And recently the MOE has tried to develop systems for evaluating teachers' effectiveness with

assessment by students, parents and principals. However, those initiatives generally were not driven successfully.

In the classrooms students are still doing sedentary work, listening to teachers and participating in recitations. The situation in classrooms prohibits students from feeling emotionally involved, thinking critically and being stimulated mentally as they are expected to do in the new system. For example, the introduction of a computer education curriculum for the information-based society brought unexpected negative effects. The application of computers and electronic musical instruments in music classes brought about decreasing emotional appreciation of music itself in students. Schools are only clinging to the "technical use" of technology rather the ethical and social issues related to problem solving and making informed decisions. The newly implemented assessment approaches that were to measure students' individual differences and abilities based on continuous, performance-based, portfolio-based multiple measures also failed to serve their true purpose, leaving teachers to implement traditional assessments that measure students' ability to recall selected knowledge. Consequently, the MOE had asked teachers to teach the subject matter with the new teaching and assessment approaches, but in the traditional environments.

These kinds of failures are due to the top-down process in implementing policy. The MOE did not succeed in providing a shared vision among the stakeholders and failed to provide scaffolding and substantial support for a positive teaching environment that is needed for the transformation of a school system. The MOE did not provide enough scaffolding to enable the teachers to adopt beliefs and values consistent with a new paradigm of education. There were very few efforts to help teachers prepare and plan for a reformed curriculum. Moreover, parents and community members were not ready for the change, and remained in the traditional mindset of a time-based educational system. Without the shared vision of all stakeholders, these change efforts are fruitless.

Without practical support to schools and teachers from the top for implementing a fundamental change, it is impossible for the change to succeed. In the decision-making process for educational transformation, the government officials, subject matter experts, parents, community members and schoolteachers should develop shared ideals, purpose and vision of education for the future. It should be an opportunity to combine top-down and bottom-up approaches to change the educational system and to discover more appropriate scaffolding and substantial support for implementing the new policy. It is also important that the stakeholders in the educational system collaboratively select the appropriate model of the new system as well as their systemic change process (with expert input). The MOE alone should not develop a new system or select from a few models.

Author Information and References for Section 3

General Influences of Suprasystems on Systemic Change

Charles M. Reigeluth is a professor in Instructional Systems Technology Department, School of Education, Indiana University. His major research focus is systemic change in public school districts. He also does research on the new paradigm of instructional methods and theories. He can be reached at reigelut@indiana.edu.

Banathy, B. H. (1991). *Systems design of education: A journey to create the future*. Englewood Cliffs, N.J., Educational Technology Publications.

Banathy, B. H. (1996). *Designing social systems in a changing world*. New York, Plenum Press.

Bennett, D. A., & King, D. T. (1991). "The Saturn School of Tomorrow." *Educational Leadership*, 48(8), 41.

Duffy, F. M. (2002). *Step-Up-To-Excellence: An innovative approach to managing and rewarding performance in school systems*. Lanham, MD, Scarecrow Education.

Duffy, F. M., Rogerson, L. G., & Blick, C. (2000). *Redesigning America's schools: A systems approach to improvement*. Norwood, Mass., Christopher-Gordon Publishers.

Jenlink, P. M., Reigeluth, C. M., Carr, A. A., & Nelson, L. M. (1998). "Guidelines for facilitating systemic change in school districts." *Systems Research and Behavioral Science*, 15(3), 217-233.

Tyack, D. B. & Cuban, L. (1995). *Tinkering toward utopia: A century of public school reform*. Cambridge, Mass., Harvard University Press.

Influences of Federal Policy on Systemic Change in K-12 Education

Susan Patrick is the President and CEO of the North American Council for Online Learning (NACOL), a nonprofit organization that develops and advocates online learning, professional development and virtual school programs in K-12 education. Her research interest is in creating models for next generation education powered by online learning. She can be contacted at spatrack@nacol.org or (703) 535-1625.

North American Council for Online Learning <http://www.nacol.org>

National Education Technology Plan <http://www.nationaletechplan.org>

Partnership for 21st Century Skills www.21stcenturyskills.org

Generation Yes <http://www.genyes.org>

NetDay <http://www.netday.org>

iEarn <http://www.iEarn.org>

Pew Internet Project Study <http://www.pewinternet.org>

Prisoners of Time, <http://www.ed.gov/pubs/PrisonersOfTime/index.html>

U.S. Department of Education, <http://www.ed.gov>

Exploring E-Learning Reforms For Michigan: The New Education (R)evolution <http://www.coe.wayne.edu/e-learningreport.pdf>

Keeping Pace with K-12 Online Learning <http://www.ncrel.org/tech/pace>

A Synthesis of New Research on K-12 Online Learning <http://www.ncrel.org/tech/synthesis/index.html>

University of California College Prep Online <http://www.uccp.org>

Florida Virtual School <http://www.flvs.net>

High Tech High <http://www.hth.org>

Virtual High School <http://www.govhs.org>

Illinois Virtual School <http://www.ivhs.or>

Kentucky Virtual School <http://www.kvhs.org>

Michigan Virtual High School <http://www.mivhs.org>

Banathy, B.H. (1991). *Systems design of education: A journey to create the future*. Englewood Cliffs, NJ: Educational Technology Publications.

Influences of NCLB on K-12 Systemic Educational Reform

Gerardo M. González is Professor and University Dean of the School of Education at Indiana University. He directs the operations of the School of Education on the Bloomington and Indianapolis campuses and provides programmatic, personnel and policy oversight of education programs at the other six regional campuses of IU. Dean González can be contacted at gonzalez@indiana.edu.

Education Week (2006, January 5). Quality Counts at 10: A decade of standards-based education. Washington, DC: Author

Sunderman, G. L., and Kim, J. S. (2005, November 3). The Expansion of federal power and the politics of implementing the No Child Left Behind Act. *Teachers College Record* <http://www.tcrecord.org> ID Number 12227, Date Accessed: 12/2/2005.

Influences of State Policy on Systemic Change in K-12 Education

Kathy Christie is vice president of knowledge management & ECS Clearinghouse for the Education Commission of the States (ECS), a non-partisan, non-profit interstate compact for education where staff work to help policymakers shape education policy. She can be reached at kchristie@ecs.org.

Influences of Charter School Policy on Systemic Change in K-12 Education

Irene F. Brock is an assistant professor in the College of Education at Indiana State University. She is currently directing the federal Teacher Quality Enhancement grant at I.S.U. to collaboratively reform its Teacher Education Programs. Her research interests include systemic reform of education, and developing collaboration among parent, school, university and community stakeholders. She can be contacted at 812-237-7742 or eebrock@isugw.indstate.edu.

National Policy Influences in an Asian Country: The Korean Case

Hong-soo Lee is a faculty member and Dean of the Center for In-Service Education at Korea National University of Education. His research interest is pre-service and in-service teacher training in music education. He can be reached at hongslee@knue.ac.kr.

Kim, S. (2004). Learner-centered perspective in understanding education theory. In B. Park (Ed.), *Educational Theory in Lifelong Learning Era*. Seoul: Kyoyukkwahaksa.

Shin, S. (1994). Korea, Republic of: System of Education. In T. Husen & N. Postlethwaite (Eds.), *The International Encyclopedia of Education*. Oxford, England: Pergamon, 3163.