Charlie,

Thank you so much for contributing to the book. The chapter you provided add a lot of value.

8/30/10

Dream! Create! Sustain!

Mastering the Art and Science of Transforming School Systems

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The Learner-Centered Paradigm of Education

Sunkyung Lee Watson and Charles M. Reigeluth

OVERVIEW

One of the themes running through this book is that there is a pressing need to replace four dominant Industrial Age paradigms that control the design and performance of school systems: Paradigm 1: the paradigm of teaching and learning; Paradigm 2: the paradigm for the design of the internal social infrastructure of school systems; Paradigm 3: the reactive, crisis-oriented paradigm guiding how school systems interact with their external environments; and Paradigm 4: the piecemeal, nonsystemic paradigm for creating and sustaining change in school systems. In this chapter, Watson and Reigeluth present a cogent argument for replacing Paradigm 1 with the Learner-Centered paradigm of education. Also, please refer to appendix D to see Reigeluth's specifications for using technology to implement the new paradigm.

The dissatisfaction with and loss of trust in schools that we are experiencing these days are a clear hallmark of the need for change in our school systems. The strong push for a learner-centered paradigm of instruction in today's schools reflects our society's changing educational needs. We educators must help our schools to move into the new Learner-Centered paradigm of instruction that better meets the needs of individual learners, of their workplaces and communities, and of society in general. It is also important that we educators help the transformation occur as effectively and

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painlessly as possible. This article begins by addressing the need for transforming our educational systems to the Learner-Centered paradigm. Then it describes the nature of the Learner-Centered paradigm.

THE NEED FOR CHANGE AND THE (CRITICAL) SYSTEMS APPROACH TO EDUCATIONAL CHANGE: INFORMATION AGE VERSUS INDUSTRIAL AGE EDUCATION

Whereas society has shifted from the Industrial Age into what many call the Information Age (Reigeluth, 1994; Senge et al., 2000; Toffler, 1984), current schools were established to fit the needs of an Industrial Age society (see table 9.1). This factory-model, Industrial Age school system has highly compartmentalized learning into subject areas, and students are expected to learn the same content in the same amount of time (Reigeluth, 1994). The current school system strives for standardization and was not designed to meet individual learners' needs. Rather, it was designed to sort students into laborers and managers (see table 9.2), and students are forced to move on with the rest of the class regardless of whether or not they have learned the material. Thus, many students accumulate learning deficits and eventually drop out.

The (Critical) Systems Approach to Educational Change

Systemic educational transformation strives to change the school system to a learner-centered paradigm that will meet all learners' educational needs. It is concerned with the creation of a completely new system, rather than a mere retooling of the current system. It entails a paradigm shift as opposed to piecemeal change. Repeated calls for massive reform of current educational and training practices have consistently been published over the last several decades. This has resulted in an increasing recognition of the need for systemic transformation in education, as numerous piecemeal approaches to education reform have been implemented and have failed to significantly improve the state of education. Systemic transformation seeks to shift from a paradigm in which time is held constant, thereby forcing achievement to vary, to one designed specifically to meet the needs of Information Age learners and their communities by allowing students the time that each needs to reach proficiency.

Table 9.1. Key Markers of Industrial Age versus Information Age Education

Industrial Age Bureaucratic Organization	Information Age Team Organization
• Autocratic leadership	• Shared leadership
• Centralized control	• Autonomy, accountability
• Adversarial relationships	• Cooperative relationships
• Standardization (mass production, mass marketing, mass communications, etc.)	• Customization (customized production, customized marketing, customized communications, etc.)
• Compliance	• Initiative
• Conformity	• Diversity
• One-way communications	• Networking
• Compartmentalization (division of labor)	• Holism (integration of tasks)

Source: Reigeluth, 1994.

Table 9.2. Key Features of Information Age Education

Sorting-Based Paradigm of Education	Learning-Based Paradigm of Education
• Time-based	• Attainment-based
• Group-based	• Person-based
• Teacher-based	• Resource-based
• Norm-based assessment	• Criterion-based assessment

Systemic educational change draws heavily from the work on critical systems theory (CST) (Flood & Jackson, 1991; Jackson, 1991a, 1991b; Watson, Watson, & Reigeluth, 2008). CST has its roots in systems theory, which was established in the mid-twentieth century by a multidisciplinary group of researchers who shared the view that science had become increasingly reductionist and the various disciplines isolated. While the term *system* has been defined in a variety of ways by different systems scholars, the central notion of systems theory is the importance of relationships among elements comprising a whole.

CST draws heavily on the philosophy of Habermas (1973, 1984, 1987). The critical systems approach to social systems is of particular importance when considering systems wherein inequality of power exists in relation to opportunity, authority, and control. In the 1980s, CST came to the forefront (Jackson, 1985; Ulrich, 1983), influencing systems theory into the 1990s (Flood & Jackson, 1991; Jackson, 1991a, 1991b). Liberating Systems Theory uses a postpositivist approach to analyze social conditions in order to liberate the oppressed, while also seeking to liberate systems theory from tendencies such as self-imposed insularity, cases of internal localized subjugations in discourse, and liberation of system concepts from the inadequacies of objectivist and subjectivist approaches (Flood, 1990). Jackson (1991b) explains that CST embraces five key commitments:

- Critical awareness of examining values entering into actual systems design
- Social awareness of recognition in pressures leading to popularization of certain systems theories and methodologies

- Dedication to human emancipation for full development of all human potential
- Informed use of systems methodologies
- Informed development of all alternative positions and different theoretical systems approaches

Banathy (1991) and Senge and associates (2000) apply systems theory to the design of educational systems. Banathy (1992a, 1992b) suggests examining systems through three lenses: a "still picture lens" to appreciate the components comprising the system and their relationships; a "motion picture lens" to recognize the processes and dynamics of the system; and a "bird's-eye view lens" to be aware of the relationships between the system and its peers and suprasystems. Senge (1990) applies systems theory specifically to organizational learning, stating that the organization can learn to work as an interrelated, holistic learning community, rather than functioning as isolated departments.

Current Progress of Systemic Change in Education

While systemic educational transformation is a relatively new movement in school change, there are currently various attempts to advance knowledge about it. Examples include: The Guidance System for Transforming Education (Jenlink, Reigeluth, Carr, & Nelson, 1996, 1998), Duffy's *Step-Up-To-Excellence* (2002), Schlechty's guidelines for leadership in school reform (1997, 2002), Hammer and Champy's Process Reengineering (1993, 2003), and Ackoff's Idealized Systems Design (1981).

There are also stories of school districts making fundamental changes in schools based on the application of systemic change ideas. One of the best practices of systemic transformation is in the Chugach School District (CSD). The two hundred students in CSD are scattered throughout 22,000 square miles of remote area in south-central Alaska. The district was in crisis twelve years ago due to low student reading ability, and the school district committed to a systemic transformation effort. Battino and Clem (2006) explain how the CSD's use of individual learning plans, student assessment binders, student learning profiles, and student life-skills portfolios supports and documents progress toward mastery in all standards for each learner. The students are given the flexibility to achieve levels at their own pace, not having to wait for the rest of the class or being pushed into learning beyond their developmental level. Graduation requirements exceed state requirements, as students are allowed extra time to achieve that level if necessary, but must meet the high rigor of the graduation level. Student accomplishment in academic performance skyrocketed as a result of these systemic changes (Battino & Clem, 2006).

Caine (2006) also found strong positive changes through systemic educational change in their extensive engagement on a project called "Learning to Learn" in Adelaide, South Australia, an initiative of the South Australian government that covered a network of over 170 educational sites. From preschool to twelfth grade, brain-based, learner-centered learning environments were combined with a larger set of systemic changes, leading to both better student achievement and significant changes in the culture and operation of the system itself.

IMAGINING LEARNER-CENTERED SCHOOLS

Given the need for paradigm change in school systems, what should our schools look like in the future? The changes in society as a whole reflect a need for education to focus on learning rather than sorting students (McCombs & Whisler, 1997; Reigeluth, 1997a; Senge et al., 2000; Toffler, 1984). A large amount of research has been conducted to advance our understanding of learning and how the educational system can be changed to better support it. There is solid research about brain-based learning, learner-centered instruction, and the psychological principles of learners that provides educators with a valuable framework for the Information Age paradigm of education (Alexander & Murphy, 1993; Bonk & Cunningham, 1998; Brush & Saye, 2000; Bransford, Brown, & Cocking, 1999; Lambert & McCombs, 1998; McCombs & Whisler, 1997).

APA learner-centered psychological principles. With significant research showing that instruction should be learner-centered to meet all students' needs, there have been several efforts to synthesize the knowledge on learner-centered instruction. First, the American Psychological Association conducted wide-ranging research to identify learner-centered psychological principles based on educational research (American Psychological Association Presidential Task Force on Psychology in Education, 1993; Lambert & McCombs, 1998). The report presents twelve principles and provides the research evidence that supports each principle. It categorizes the psychological principles into four areas: (1) cognitive and metacognitive, (2) motivational affective, (3) developmental and social, and (4) individual difference factors that influence learners and learning (see table 9.3).

National Research Council's How People Learn. Another important line of research was carried out by the National Research Council to synthesize knowledge about how people learn (Bransford, Brown, & Cocking, 1999). A two-year study was conducted to develop a synthesis of new approaches to instruction that "make it possible for the majority of individuals to develop a deep understanding of important subject matter" (p. 6). Their analysis of a wide range of research on learning emphasizes the importance

Table 9.3. Learner-Centered Psychological Principles

APA Learner-Centered Psychological Principles	
Cognitive and Metacognitive Factors	• *Nature of the learning process.* The learning of complex subject matter is most effective when it is an intentional process of constructing meaning from information and experience. • *Goals of the learning process.* The successful learner, over time and with support and instructional guidance, can create meaningful, coherent representations of knowledge. • *Construction of knowledge.* The successful learner can link new information with existing knowledge in meaningful ways. • *Strategic thinking.* The successful learner can create and use a repertoire of thinking and reasoning strategies to achieve complex learning goals. • *Thinking about thinking.* Higher-order strategies for selecting and monitoring mental operations facilitate creative and critical thinking. • *Context of learning.* Learning is influenced by environmental factors, including culture, technology, and instructional practices.
Motivational and Affective Factors	• *Motivational and emotional influences on learning.* What and how much is learned is influenced by the learner's motivation. Motivation to learn, in turn, is influenced by the individual's emotional states, beliefs, interests and goals, and habits of thinking. • *Intrinsic motivation to learn.* The learner's creativity, higher-order thinking, and natural curiosity all contribute to motivation to learn. Intrinsic motivation is stimulated by tasks of optimal novelty and difficulty, relevant to personal interests, and providing for personal choice and control. • *Effects of motivation on effort.* Acquisition of complex knowledge and skills requires extended learner effort and guided practice. Without learners' motivation to learn, the willingness to exert this effort is unlikely without coercion.
Developmental and Social Factors	• *Developmental influences on learning.* As individuals develop, there are different opportunities and constraints for learning. Learning is most effective when differential development within and across physical, intellectual, emotional, and social domains is taken into account. • *Social influences on learning.* Learning is influenced by social interactions, interpersonal relations, and communication with others.
Individual Differences Factors	• *Individual differences in learning.* Learners have different strategies, approaches, and capabilities for learning that are a function of prior experience and heredity. • *Learning and diversity.* Learning is most effective when differences in learners' linguistic, cultural, and social backgrounds are taken into account. • *Standards and assessment.* Setting appropriately high and challenging standards and assessing the learner as well as learning progress—including diagnostic, process, and outcome assessment—are integral parts of the learning process.

Source: American Psychological Association's Board of Educational Affairs, Center for Psychology in Schools and Education, 1997.

of customization and personalization in instruction for each individual learner, self-regulated learners taking more control of their own learning, and facilitating deep understanding of the subject matter. They describe the crucial need for, and characteristics of, learning environments that are learner centered and learning-community centered.

Learner-centered schools and classrooms. McCombs and colleagues (Baker, 1973; Lambert & McCombs, 1998; McCombs & Whisler, 1997) also address these new needs and ideas for instruction that supports all students. They identify two important features of learner-centered instruction:

> a focus on individual learners (their heredity, experiences, perspectives, backgrounds, talents, interests, capacities, and needs) [and] a focus on learning (the best available knowledge about learning, how it occurs and what teaching practices are most effective in promoting the highest levels of motivation, learning, and achievement for all learners). (McCombs & Whisler, 1997, p. 11)

This twofold focus on learners and learning informs and drives educational decision making processes. In learner-centered instruction, learners are included in these educational decision making processes, the diverse perspectives of individuals are respected, and learners are treated as cocreators of the learning process (McCombs & Whisler, 1997).

Personalized Learning. Personalized Learning is part of the learner-centered approach to instruction, dedicated to helping each child to engage in the learning process in the most productive and meaningful way to optimize each child's learning and success. Personalized Learning was cultivated in the 1970s by the National Association of Secondary School Principals (NASSP) and Learning Environments Consortium (LEC) International, and was adopted by the special education movement. It is based upon a solid foundation of the NASSP's educational research findings and reports as to how students learn most successfully (Keefe, 2007; Keefe & Jenkins, 2002), including a strong emphasis on parental involvement, more teacher and student interaction, attention to differences in personal learning styles, smaller class sizes, choices in personal goals and instructional methods, student ownership in setting goals and designing the learning process, and technology use (Clarke, 2003). Leaders in other fields, such as businessman Wayne Hodgins (in Duval, Hodgins, Rehak, & Robson, 2004), have presented the idea that learning will soon become personalized, where the learner both activates and controls her or his own learning environment.

Differentiated Instruction. The recent movement in differentiated instruction is also a response to the need for a learning-focused (as opposed to a sorting-focused) approach to instruction and education in schools. Differentiated instruction is an approach that enables teachers to plan strategically to meet the needs of every student. It is deeply grounded in the principle that there is diversity within any group of learners and that teachers should adjust students' learning experiences accordingly (Tomlinson, 1999a, 1999b, 2003). This draws from the work of Vygotsky (1986), especially his "zone of proximal development" (ZPD), and from classroom researchers. Researchers found that with differentiated instruction, students learned more and felt better about themselves and the subject area being studied (Tomlinson, 2003). Evidence further indicates that students are more successful and motivated in schools if they learn in ways that are responsive to their readiness levels (Vygotsky, 1986), personal interests, and learning profiles (Csikszentmihalyi, 1990; Sternberg, Torff, & Grigorenko, 1998). The goal of differentiated instruction is to address these three characteristics for each student (Tomlinson, 2003).

Brain research and brain-based instruction. Another area of study that gives us an understanding of how people learn is the work on brain research that describes how the brain functions. Caine and Caine (1997) and Caine, Caine, McClintic, and Klimek (2005) provide a useful summary of work on how the brain functions in the process of learning through the twelve principles of brain-based learning. Brain-based learning begins when learners are encouraged to actively immerse themselves in their world and their learning experiences. In a school or classroom where brain-based learning is being practiced, the significance of diverse individual learning styles is taken for granted by teachers and administrators (Caine & Caine, 1997). In these classrooms and schools, learning is facilitated for each individual student's purposes and meaning, and the concept of learning is approached in a completely different way from the current classrooms that are set up for sorting and standardization.

An Illustration of the New Vision

What might a learner-centered school look like? An illustration or synthesis of the new vision may prove helpful.

Imagine that there are no grade levels for this school. Instead, each of the students strives to master and check off their attainments in a personal "inventory of attainments" (Reigeluth, 1994) that details the individual student's progress through the district's required and optional learning standards, kind of like merit badges in the Boy Scouts. Each student has different levels of progress in every attainment, according to his or her interests, talents, and pace. The student moves to the next topic as soon as she or he masters the current one. While each student must reach mastery level before moving on, students also do not need to wait for others who are not yet at that level of learning. In essence, now, the schools hold time constant and student learning is thereby forced to vary. In this new paradigm of the learner-centered school, it is the pace (learning time) that varies rather than student learning. All students work at their own maximum pace to reach mastery in each attainment. This individualized, customized, and self-paced learning process allows the school district to realize high standards for its students.

The teacher takes on a drastically different role in the learning process. She or he is a guide or facilitator who works with the student for at least four years, building a long-term, caring relationship (Reigeluth, 1994). The teacher's role is to help the student and parents to decide upon appropriate learning goals and to help identify and facilitate the best way for the student to achieve those goals—and for the parents to support their student. Therefore, each student has a personal learning plan in the form of a contract that is jointly developed every two months by the student, parents, and teacher.

This system enhances motivation by placing greater responsibility and ownership on the students, and by offering truly engaging, often collaborative work for students (Schlechty, 2002). Teachers help students to direct their own learning through the contract development process and through

facilitating real-world independent or small-group projects that focus on developing the contracted attainments. Students learn to set and meet deadlines. The older the students get, the more leadership and assisting of younger students they assume.

The community also works closely with schools, as the inventory of attainments includes standards in service learning, career development, character development, interpersonal skills, emotional development, technology skills, cultural awareness, and much more. Tasks that are vehicles for such learning are authentic tasks, often in real community environments that are rich for learning (Reigeluth, 1994). Most learning is interdisciplinary, drawing from both specific and general knowledge and interpersonal and decision-making skills. Much of the focus is on developing deep understandings and higher-order thinking skills.

Teachers assess students' learning progress through various methods, such as computer-based assessment embedded in simulations, observation of student performances, and analysis of student products of various kinds. Instead of grades, students receive ratings of "emerging," "developing," "proficient" (the minimum required to pass), or "expert."

Each teacher has a cadre of students with whom she or he works for several years—a developmental stage of their lives. The teacher works with three to ten other teachers in a small learning community (SLC) in which the learners are multiaged and get to know each other well. Students get to choose which teacher they want (stating their first, second, and third choice), and teacher bonuses are based on the amount of demand for them. Each SLC has its own budget, based mainly on the number of students it has, and makes all its own decisions about hiring and firing of its staff, including its principal (or lead teacher). Each SLC also has a school board made up of teachers and parents who are elected by their peers.

While this illustration of a learner-centered school is based on the various learner-centered approaches to instruction reviewed earlier, and the latest educational research, this is just one of many possible visions, and these ideas need revision, as some are likely to vary from one community to another, and most need further elaboration on details. Nonetheless, this picture of a learner-centered paradigm of schooling could help us to prevail over the Industrial Age paradigm of learning and schools so that we can create a better place for our children to learn.

CONCLUSION

Our society needs learner-centered schools that focus on learning rather than on sorting (McCombs & Whisler, 1997; Reigeluth, 1997a; Senge et al., 2000; Toffler, 1984). New approaches to instruction and education have

increasingly been advocated to meet the needs of all learners, and a large amount of research has been conducted to advance our understanding of learning and how the educational system can be changed to better support it (Alexander & Murphy, 1993; McCombs & Whisler, 1997; Reigeluth, 1997a; Senge et al., 2000). Nevertheless, transforming school culture and structure is not an easy task.

Isolated reforms, typically at the classroom and school levels, have been attempted over the past several decades, and their impact on the school system has been negligible. It has become clear that transforming the paradigm of schools is not a simple job. Teachers, administrators, parents, policymakers, students and all other stakeholder groups must work together, as they cannot change such a complex culture and system alone. In order to transform our schools to be truly learner-centered, a critical systems approach to transformation is essential.

The first article in this series (Reigeluth & Duffy, 2008) described the FutureMinds approach for state education departments to support this kind of change in their school districts. The second article (Duffy & Reigeluth, 2008) described the School System Transformation (SST) Protocol, a synthesis of the current knowledge about how to help school districts use a critical systems approach to transform themselves to the Learner-Centered paradigm of education. Hopefully, with state leadership through FutureMinds, the critical systems approach to educational change in the SST Protocol, and the new knowledge about learner-centered instruction, we will be able to create a better place for our children to learn and grow. However, this task will not be easy. One essential ingredient for it to succeed is the availability of powerful tools to help teachers and students in the Learner-Centered paradigm. The fourth article in this series will address this need.