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From One-Size-Fits-All to Personalized Learner-Centered Learning: The Evidence

by

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This edition of the **Duffy Reports** features an article by Dr. Barbara McCombs, Senior Research Scientist and Director of the *Human Motivation, Learning, and Development Center* at the University of Denver Research Institute. She is a renowned expert in the field of personalized, learner-centered learning.

Some of the content for her article is taken from two books by her and Dr. Lynda Miller. The first book is *Learner-centered classroom practices and assessments: Maximizing student motivation, learning, and achievement* (2007) and the second book is *The School Leader's Guide to Learner-Centered Education and Assessments* (2008, in press). Both books are published by Corwin Press in Thousand Oaks, California.

In this article she argues for the importance of creating schools and school systems that provide students with personalized, learner-centered learning. Her ar-

gument marshals an important body of research documenting the effectiveness and positive outcomes of personalized learning.

While personalized learning has a long history of being advocated (dating back at least to John Dewey) efforts to implement personalized learning in schools and school systems have not been widely successful. Part of this lack of success can be attributed to the lack of technology to help teachers and administrators design and manage personalized learning. That problem is being solved with the advent of learning management systems¹ that provide educators with the technology they need to personalize learning.

¹ Dr. Charles Reigeluth and a team of graduate students at Indiana University are writing an article about learning management systems. It will appear in Volume 48, Number 6 of *Educational Technology*

Another obstacle to the successful implementation of personalized learning is the perception that personalized learning is only marginally more effective than traditional group instruction. Dr. McCombs' article blasts right through that obstacle with her impressive summation of research data that document the effectiveness and value of personalized learning.

The Association for Educational Communications and Technology (AECT) is on the leading edge of transformational change in school systems. In 2007, AECT launched a new nationwide initiative to help state departments of education transform local school systems in their states from the Industrial-Age paradigm of teaching and learning to a paradigm better suited to the needs of the Information-Age. One of the key elements of the Information-Age paradigm is that teaching and learning need to be personalized and learner-centered.

Dr. Charles Reigeluth and I² are the co-directors of the **FutureMinds: Transforming American School Systems** initiative. Dr. McCombs is a member of the Advisory Board for the FutureMinds initiative.

Dr. McCombs' article begins below. I am sure that you will enjoy reading it and appreciate the power of her evidence in support of personalized, learner-centered learning.

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*We are born learning beings. We naturally imagine, wonder, invent, and explore our way into unknown territories and perplexing and paradoxical questions. Our curiosity and insatiable drive to know and figure things out is innate.*

*Stephanie Pace Marshall (2005), p. 11.*

Natural learning principles and assumptions - which we know intuitively and experientially - just do not fit with the unnatural design of schooling today. In this high-stakes testing culture,

<sup>2</sup> Dr. Reigeluth is a professor in the Instructional Systems Technology Department at Indiana University. I am a professor of change leadership in education in the Department of Administration and Supervision at Gallaudet University.

teachers have become unsupported in their efforts to focus on individual learners, student achievement, the arts, and students as whole persons. What began as an effort to create a culture of achievement for all has resulted instead in a culture in which achievement has been subverted, leaving teachers and school leaders weary and demoralized. Not only does the current paradigm include fear-based sanctions, but the instructional approach is a one-size-fits-all model which increasingly alienates students and staff.

### **Personalized Learning is "Learner-Centered"**

Personalized learning is person- or learner-centered. For decades, educators and researchers have argued that the basic approach to education should be one that strives to meet unique and fundamental human needs and develop human potential (Patterson, 2003). For example, William Glasser (1990), creator of choice theory and Quality Schools, has maintained that we will not have more motivated students who work harder and learn more, nor we will not have lower dropout rates, until we create more need-satisfying schools. When schools are more personalized and need-satisfying, and not aimed at controlling students, we will be able to avoid tragedies such as the violence at Columbine High School and

others. These new kinds of schools will provide environments where students can really get to know their peers and teachers and develop a sense of trust. When the focus is on standards and coverage of materials, students are bored, and they know the system isn't about them.

From my work over the past 15 years, we have learned that being learner-centered means three things. First, each learner learns through a unique combination of factors, including "heredity; temperament; experiential history; beliefs, values, and perspectives; talents; interests; capacities; and needs" (McCombs & Miller, 2007, p. 15). This means that each learner approaches any given learning situation with a set of strengths and challenges built on the history of her/his previous learning experiences, and each person's history is at least slightly different from everyone else's. For learning to be effective, it must take into account the various factors and histories associated with each learner. The people in the system must value diversity, trust the natural dispersion of talents and interests, and strive to help each learner discover and develop his or her own unique place in the world.

Second, being learner-centered means focusing on the best available evidence about learning, how

it occurs, and which teaching practices are most likely to result in the highest levels of student motivation and achievement (McCombs & Whisler, 1997). What we know is that the most highly motivated learning of all is self-motivated learning, which occurs “only when learners possess (1) choice and control about how, what, and when to learn, and (2) choice and control over what they want to achieve” (McCombs & Miller, 2007, p. 16).

Third, being learner-centered means that the content of learning - the knowledge and skills needed for our future world and present realities - must equip learners with the capacity for complex and systemic thinking, for focused inquiry and reflection on who they are and what the world needs. The curriculum is the curriculum of life, with basic skills integrated into authentic and real world problem solving. Learning paths and learning content must be allowed to vary as students and their teachers solve real world and complex problems in joint inquiry and with a moral and ethical concern with the future of ourselves and the world across personal, social, economic, political, and environmental boundaries.

Learner-centered thus means focusing on individual learners and their personal learning desires, needs, and experiences,

using the best available evidence and knowledge about learning and the teaching practices that best support learning for everyone - students, teachers, families, and administrators. Figure 1 shows our Learner-Centered Model (LCM) including the evidence-based principles or set of factors that impact both learners and learning.

The core of the LCM is that all instructional decisions begin with knowing who the learners are - individually and collectively. This is followed by thoroughly understanding learning and how best to support learning for all people in the system. Finally, decisions about what practices should be in place at the school and classroom levels depend upon what we want learners to know and be able to do. The LCM puts the *personal domain* - the learners - at the heart of a system dedicated to learning and leading. It brings the educational system back into balance with what we know about learners, leading, and living systems.

### **Grounding for Learner-Centered Practices: Solid, Evidence-Based Principles**

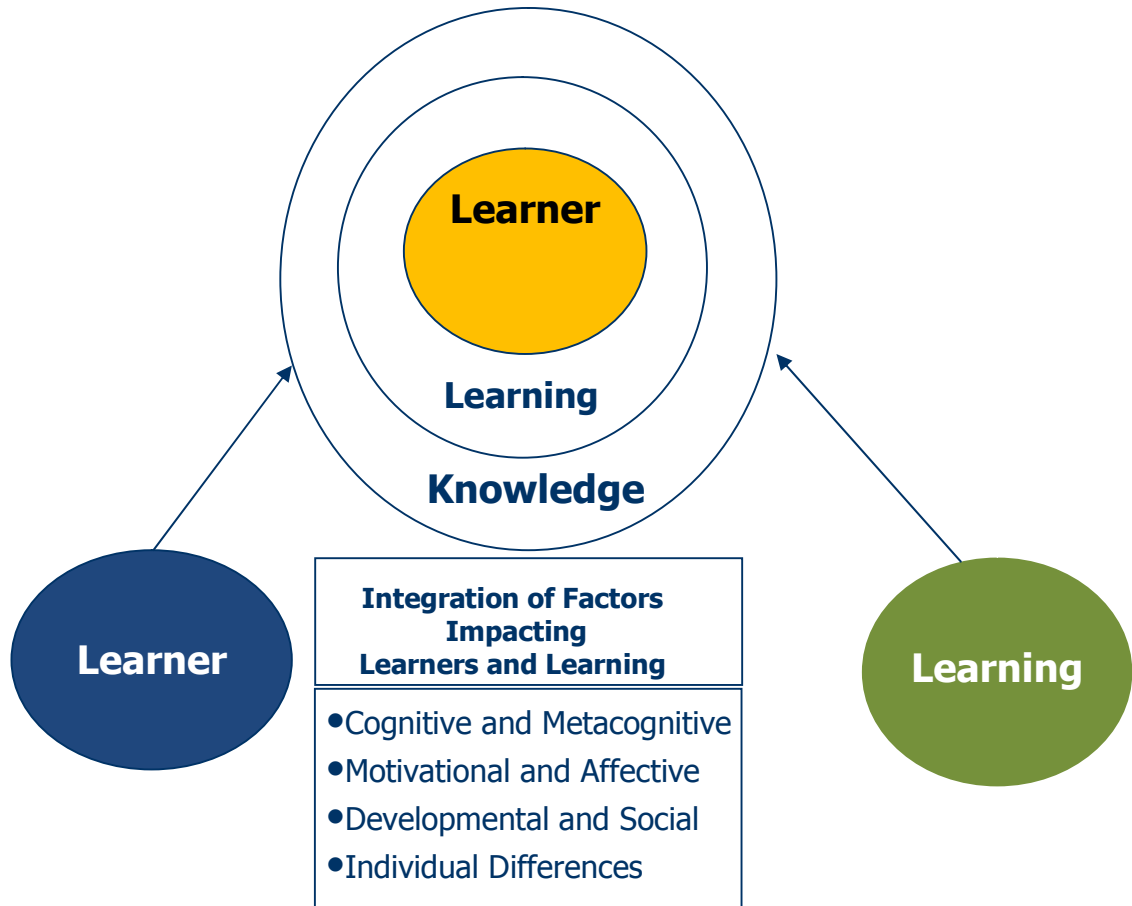
Few would disagree that we want to prepare all students for productive lives and to be lifelong learners. In spite of differing politics, most would favor solutions that are empowering and in keeping with natural learning principles and laws of

human functioning. These principles and laws include the natural range and diversity in human talents, abilities, and interests. In trusting natural principles that “sort” learners into the range of skills and interests needed to support a productive democratic and global society, we move away from standardized “one-size fits all” educational paradigms and toward a transformed view of systems that rewards and supports diversity and the development of individual potential in the context of democratic social ideals. Naturally, we want these transformational solutions to be evidence-based and lead to high levels of learning and achievement. More importantly, however, we want them to embody the fullness of what it means to be human and to live with purpose and meaning.

### *The Learner-Centered Psychological Principles*

As a grounding for such transformed practices, the American Psychological Association (APA) adopted the *Learner-Centered Psychological Principles* (Learner-Centered Principles) in 1997, largely as a response to what the APA considered ill-informed decisions being made based on *A Nation at Risk* (National Commission on Excellence and Education, 1983), which concluded that student achievement in the U.S. showed an

Figure 1: Learner-Centered Model: A Holistic Perspective



alarming decline, especially in comparison with other countries such as Japan. The APA was concerned that the push toward testing and accountability was not informed by evidence regarding what best supports and fosters learning. Members of the APA Task Force working on the Learner-Centered Principles believed that psychology, as a scientific field that has studied learning for over 100 years, had a responsibility to clearly present to educators and policymakers its accumulated and research-validated knowledge base about learning and learners. The research that is summarized in the *APA Principles* derives from many fields, including psychology, education, sociology, and brain research.

Research documentation can be found in Alexander & Murphy (1998), Combs, Miser, & Whitaker (1999); Kanfer & McCombs (2001); Lambert & McCombs (1998); McCombs (2000, 2001, 2004); McCombs & Miller (2007); McCombs & Whisler (1997); and Perry and Weinstein (1999). Copies of the *Principles* may be downloaded from <http://www.apa.org/ed/Learner-Centered-Principles2/Learner-Centered-Principles14.html>

The Learner Centered Principles, summarized in Table 1, serve as the foundation for the Learner Centered Model (LCM) in Figure 1 researched over the

past decade (McCombs, 2003, 2004; McCombs & Lauer, 1997; McCombs & Miller, 2007; McCombs & Whisler, 1997). The 14 Learner Centered Principles, organized into four categories or domains, define what is known about learning and learners as a result of research into both.

Taken together, the four domains of the Learner Centered Principles offer a holistic way of viewing how the individual principles combine and interact to influence learners and learning. The Learner Centered Principles reflect four domains:

- *Cognitive and meta-cognitive* - the intellectual capacities of learners are and how they facilitate the learning process.
- *Motivational and affective* - the roles played by motivation and emotions in learning.
- *Developmental and social* - the influence of various, diverse aspects of learner development and the importance of interpersonal interactions in learning and change.
- *Individual differences* - how individual differences influence learning, how teachers, students, and administrators adapt to learning diversity, and how standards and assessments can best

support individual differences in learners.

Each of the four domains affects each learner in a unique way, as does the synergy resulting from the interaction of the domains.

### *A Learner-Centered Educational Model*

For centuries educators have been arguing that a one-size-fits-all model that standardizes curriculum and enforces testing violates biological and ecological principles. What does seem to work are alternatives based on systems theory and an ecology of learning. In our work with the Learner Centered Principles, we have learned that Learner Centered Practices do not look the same from school to school, classroom to classroom, day to day, or even moment to moment within the same classroom. When teachers are attentive to learners and their learning needs, and when they understand basic principles of human learning, motivation, development, and individual differences, they “go with the flow” and create innovative environments that are flexible and dynamic. Teachers and school administrators we have studied who are the most learner-centered are not afraid to share power and control with students in a collaborative learning partnership (McCombs & Miller, 2007).

**Table 1: The Learner-Centered Psychological Principles****COGNITIVE AND METACOGNITIVE FACTORS**

**Principle 1: 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.

**Principle 2: Goals of the learning process.** The successful learner, over time and with support and instructional guidance, can create meaningful, coherent representations of knowledge.

**Principle 3: Construction of knowledge.** The successful learner can link new information with existing knowledge in meaningful ways.

**Principle 4: Strategic thinking.** The successful learner can create and use a repertoire of thinking and reasoning strategies to achieve complex learning goals.

**Principle 5: Thinking about thinking.** Higher order strategies for selecting and monitoring mental operations facilitate creative and critical thinking.

**Principle 6: Context of learning.** Learning is influenced by environmental factors, including culture, technology, and instructional practices.

**MOTIVATIONAL AND AFFECTIVE FACTORS**

**Principle 7: 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.

**Principle 8: 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.

**MOTIVATIONAL AND AFFECTIVE FACTORS (continued)**

**Principle 9: 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**

**Principle 10:** Developmental influence on learning. As individuals develop, they encounter different opportunities and experience different constraints for learning. Learning is most effective when differential development within and across physical, intellectual, emotional, and social domains is taken into account.

**Principle 11: Social influences on learning.** Learning is influenced by social interactions, interpersonal relations, and communication with others.

**INDIVIDUAL DIFFERENCES FACTORS**

**Principle 12: Individual differences in learning.** Learners have different strategies, approaches, and capabilities for learning that are a function of prior experience and heredity.

**Principle 13: Learning and diversity.** Learning is most effective when differences in learners' linguistic, cultural, and social backgrounds are taken into account.

**Principle 14: Standards and assessment.** Setting appropriately high and challenging standards and assessing the learner and learning progress—including diagnostic, process, and outcome assessment—are integral parts of the learning process.

Summarized from the APA Work Group of the Board of Educational Affairs (1997, November). *Learner-centered psychological principles: Guidelines for school reform and redesign*. Washington, DC: American Psychological Association.



When translated into practice, the Learner Centered Model consists of a variety of materials, guided reflection, and assessment tools that support teacher and administrator effectiveness and change at the individual and school levels. As support for changing their practices, our research (McCombs, 2001, 2003; McCombs & Lauer, 1997; McCombs & Whisler, 1997) has produced a set of self-assessment and reflection tools for K-20 educators, called the Assessment of Learner-Centered Practices (ACLP). The ACLP includes surveys - for teachers, students, and administrators - that facilitate reflection and a willingness to change instructional practices. The teacher and administrator surveys offer an opportunity for reflection on how personal beliefs about learners, learning, and teaching coincide with the knowledge base underlying the Learner Centered Principles. At the school level, they allow administrators and teachers to see the discrepancies between what they value and what they perceive to be actually in place in eight key areas of school functioning. At the classroom level, the ACLP surveys allow teachers to become aware of their students' perceptions about the frequency of their teacher's learner-centered practices. In addition, we have developed staff development workshops and videos that illustrate the learner-centered practices in diverse school settings.

### What the Research Shows About the Effectiveness of Learner-Centered Models

The research evidence includes a major study that analyzed the accumulated evidence of the benefits of learner- or person-centered educational models. Next is the evidence from our own research.

#### *Large Scale Research Findings*

Cornelius-White (2007) reviewed 119 studies that investigated the efficacy and associations of learner-centered instructional relationships with comprehensive student success. The studies synthesized were published between 1948 and 2004, written in English or German, and conducted in most areas of the US, the Philippines, Brazil, Germany, Austria, the UK, and Canada. The studies involved over 350,000 students, nearly 15,000 teachers, and 1450 separate findings from pre-school to graduate school. In this meta-analysis of person-centered education models, Cornelius-White (2007) found that person and learner-centered education is associated with large increases in student participation/initiation ( $r = .55$ ), satisfaction ( $r = .44$ )<sup>3</sup>,

<sup>3</sup> **Publisher's Note:** these  $R = x$  statistics are Pearson  $R$  correlations. The Pearson  $R$  is one of the most widely used statistics to determine the strength of relationships among selected re-

and motivation to learn ( $r = .32$ ), all of which indicated high levels of engagement in learner-centered classrooms. There were also positive effects on self-esteem ( $r = .35$ ) and social connections and skills ( $r = .32$ ) and reductions in dropout ( $r = .35$ ), disruptive behavior ( $r = .25$ ) and absences ( $r = .25$ ). This meta-analysis also found support for the importance of student perspectives as better predictors of their own academic success than teacher perspectives on the frequency with which they performed learner-centered practices.

The major teacher variables associated with positive student outcomes include positive relationships, nondirectivity, empathy, warmth, and encouraging thinking and learning skills. Cornelius-White (2007) also found that

search variables. Pearson  $R$ s can vary in magnitude from -1 to 1, with -1 indicating a perfect negative relationship and 1 indicating a perfect positive relationship, and 0 indicating no relationship between two variables. It is generally agreed among researchers that a weak relationship has an  $R = 0.1$  value; a medium strength relationship has an  $R = 0.3$  value; and a strong relationship has an  $R = 0.5$ . Thus, the  $R$  values reported by Dr. McCombs have medium to strong relationships among the variables in the referenced research.

learner-centered practices may work better with minority teachers and learners, suggesting that these universal variables are particularly important for students who traditionally do not receive this level of support. In general, the results showed that learner-centered instruction had an overall corrected correlation average of  $r = .31$ . Cornelius-White concluded that the overall finding show that LCI is highly associated with student success.

Cornelius-White (2007) concludes that the synthesis of the research also found that what is observable is most potent in another way. Considering the 1450 separate findings from the meta-analysis together, observers and students' perspectives yield higher associations to student success than teachers' views. In other words, the genuine, warm empathy that is central to learner-centered practices has to be perceived by, experienced, and relevant for the student, not just be "nice" in intent, for it to really be effective. The meta-analysis forms a solid foundation to support using learner-centered instruction in schools and classrooms. This type of instruction is part of a bigger model that focuses on the core principles of encouragement, challenge, and adaptation.

*Evidence from Work Based on the APA Learner-Centered Principles*

of research with the Learner Centered Model and its associated tools, we have verified the benefits of learner-centered practices at the school and classroom levels. Research with the ACLP self-assessment surveys for teachers and students confirms that "learner-centeredness" is not solely a function of particular instructional practices or programs. Rather, learner-centeredness is a complex interaction of the programs, practices, policies, and people as perceived by the individual learners. That is, how teachers are perceived (their qualities and characteristics) as well as how instructional practices are implemented in terms of meeting student learning needs, defines learner-centeredness. Ongoing data of over 35,000 students and their teachers in Kindergarten through graduate school have now been collected with the ACLP surveys (McCombs, 2001; McCombs & Lauer, 1997; McCombs & Pierce, 1999; McCombs & Quiat, 2002) to evaluate programs and practices that enhance the teaching and learning process.

In our research (McCombs, 2004), the qualities related to being perceived by students as engaging in high levels of learner-centered practice in domains most related to high achievement and motivation include:

- high learner-centered beliefs (consistent with the APA principles) versus low non learner-centered beliefs (more traditional),
- high levels of self-efficacy about their ability to reach and teach diverse learners,
- high reflective self-awareness, and
- high degrees of support for autonomy.

In schools and districts where the Learner Centered Principles have been widely shared and implemented, teaching practices are achieving a more balanced approach that encourages high student learning and achievement, while also promoting learner-centered approaches. These approaches, recognized in many of the nation's most excellent schools, lead to effective schooling and to positive mental health and productivity of our nation's children, their teachers, and the systems that serve them. A summary of our results follows.

#### *Grades K-3 Results*

The most important finding with K-3 teachers and students is that even young children can reliably and validly assess the degree to which their teachers engage in learner-centered practices. For young children, our evidence shows that there are three types of



teacher practices that correlate most closely to positive learning and motivation outcomes:

1. creates positive interpersonal relationships/climate,
2. provides motivational support for learning, and
3. facilitates thinking and learning.

Our results indicate that, when students perceived more learner-centered teacher practices, they had higher academic achievement and also reported greater interest in and liking of school and academic subjects (McCombs, Daniels, & Perry, 2008, in press).

#### *Grades 4-8 Results*

With upper elementary and middle school students, learner-centered practices begin to have even stronger impacts on learning and motivation. Four types of teacher practice have been shown to most impact learning, motivational, and behavior outcomes:

1. creating positive relationships,
2. honoring student voice,
3. supporting higher order thinking and learning skills, and
4. adapting to individual differences (McCombs & Quiat, 2002; McCombs, 2004;

Meece, Herman, & McCombs, 2003).

At this developmental stage, students' perceptions of classroom practices are more strongly related to valued outcomes than to teachers' perceptions.

#### *Grades 9-12 Results*

For high school students, the importance and effects of learner-centered practices increase. At this level, although our research tool contains different items from the instrument used for the grade 4-8 level, the same four types of practice identified in the grades 4-8 level emerge (McCombs, 2004b). Our findings show that students' perceptions that their teachers frequently perform the four types of learner-centered classroom practice are significantly correlated with all motivation variables, and are particularly highly related to student self-efficacy, epistemic (knowledge-seeking) curiosity, active learning strategies, and task mastery goals. In addition, students' perceptions that their teachers significantly perform these four types of practice are positively correlated with classroom achievement and negatively correlated with classroom absences.

#### *College Level Results*

For college students who are capable of further differentiating domains of practice that are most signifi-

cantly related to their motivation, learning, and retention in higher education, our research (McCombs, 2003, 2004; McCombs & Pierce, 1999; Pierce, Holt, Kolar, & McCombs, 2004) has shown that there are five domains of practice, ordered in terms of their empirical relationships to desired student outcomes as follows:

1. establishing positive interpersonal relationships;
2. facilitating the learning process;
3. adapting to class learning needs;
4. encouraging personal challenge and responsibility; and
5. providing for individual and social learning needs.

What is significant across all levels of schooling is that the relational domain - practices that establish positive student-teacher and student-student relationships along with a positive climate for learning - is essential to being learner-centered in the eyes of students. This domain of practice actually increases in importance as students get older and the system becomes less and less about them.

#### **The "Big Picture" View: Personalizing with an Ecology of Learning Model**

Situating human learning principles within the larger framework of human and systems functioning helps to clarify the fundamental cause of current imbalances in our educational models and philosophies. The “industrial paradigm” that characterizes most 21<sup>st</sup> century organizations, including schools and school systems, reflects the mismatch between principles of nature, personalization, and human functioning.

In general, an ecology is a complex, open system, its elements able to adapt in a dynamic and interdependent way because of its diversity. In a learning ecology, a diversity of personalized learning options is created and delivered to students (including teachers) by way of opportunities they can use to learn through the methods and means that best support their unique situations, needs, and interests (Brown, 1999). Richardson (2002) tell us that, in a successful learning ecology, students can immediately “search for, locate, and quickly access elements of learning that address their immediate needs. Students use the ecology to construct and organize personalized, unique interactions with the content” (p. 2). Further, Richardson argues, a learning ecology supports social learning through students forming teams to collaborate on activities, or self-organizing into groups to explore learning topics.

### *What are the New Notions of Schooling as Part of Living Systems?*

One of the strongest implications of the Learner Centered Principles and Learner Centered Model is that education must address the whole learner. This is certainly not a new idea. Many educators have advocated for holistic education models (e.g., Combs, 1986, 1991; Noddings, 2005). However, the evidence base for addressing the whole learner was less clear in earlier years than it is now, making the current case stronger in terms of positive outcomes that extend beyond academic achievement. Noddings (2005) argues that schools were established as much for moral and social reasons as for academic instruction, that they are established to serve both individuals and the larger society. This means that we want not only competent workers but graduates with sound character, social conscience, the ability to think critically, and an awareness of global problems. Noddings (2005) further argues that, to sustain our democracy, schools need to help develop thoughtful citizens who can make wise civic choices.

Eisner (2005) also believes that current policies, which are focused on having clear outcomes defined by measurable standards so we can measure performance and hold schools and teachers accountable,

are highly rational and logical. The problem is that these policies narrow the vision of education and deal only with intellectual capacities, neglecting the social and emotional qualities of students and situations. They promote a technical rather than organic, humanistic, or personal orientation to teaching that does not work well with living beings. Eisner argues we need to return to the vision of progressive education, as formulated by Dewey, recognized the distinctive talents of individual children and created environments to actualize those potentialities. This vision means that teachers and school leaders should design experiences that allow students to respond not just in cognitive ways, but also emotionally, imaginatively, and socially. It also means that assessment should focus on more than academic outcomes and include assessments of students’ development in all these areas.

### *A Leadership Challenge*

A challenge for school leaders is to capture these best practice principles in an educational systems design that prepares all learners (students and adults alike) to be lifelong learners and develop their full potentials in life.

These new systems carry a much higher potential to result in a more competent, more productive, more collaborative, and more crea-

tive cadre of people who can make significant changes to existing and outdated systems in all aspects of our lives, not just the educational. To be leaders in such a movement requires all of us to be the best that we can be and to use the tools of reflection, rethinking, and renewing that are part of an ecology of learning in living systems. Using learner-centered leadership practices can transform schools from one-size-fits-all systems to personalized learner-centered systems that promote a continuous learning and improvement process for all those involved, not just students.

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Thank you for your interest in these Reports.

*Francis M. Duffy*



In the past, these reports often contained articles written by readers. If you would like to write an article for these reports on a topic related to whole-system change in school districts, please send a copy of it to me as an E-mail attachment to [duffy@thefmduffygroup.com](mailto:duffy@thefmduffygroup.com).

The *FutureMinds: Transforming American School Systems* initiative creates collaborative relationships with state departments of education to help them transform school systems in their states. You may visit the FutureMinds website by going to [www.futureminds.us](http://www.futureminds.us).

The Rowman & Littlefield Education *Leading Systemic School Improvement Series* is a collection of books about "why" systemic change in school districts is needed, "what" some of the desirable outcomes of systemic change should be, and "how" to create and sustain systemic change. You can visit the website for the series by going to <http://www.rowmaneducation.com/bookseries/LSI>.

Please feel free to share copies of these reports with your colleagues. All that I ask is that the information you find in these reports be attributed to the author(s). For references to this article, please use the following format:

McCombs, B. L. (2008). From one-size-fits-all to personalized learner-centered learning: The evidence *The F. M. Duffy Reports, 13*(2), 1-12.