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## Chapter 7 Overview



Openness is composed of two basic parts. The first depicts a high plateau, wild and barren. It implies emptiness. The second part originally symbolized two humans standing back to back on a mound, a vantage point from which they could see in all directions. (Lao-tzu, 1986 trans. by R. L. Wing)

Drawing by K. P. Lau.

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# 7

## Change Patterns

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### Changing Minds

*New frameworks are like climbing mountains—the larger view encompasses, rather than rejects, the earlier more restricted view.*

—Albert Einstein

This *Field Guide* is fundamentally about change and how visual tools facilitate change at many levels and over a lifespan of learning. What is *change*? On the most basic level, change is the process of transforming something, not into something completely new, but encompassing the old and bringing it into a new *form*. New forms are *physically* integrated into new neural networks in the brain, changing the mind, and possibly changing the outward behaviors of a learner.

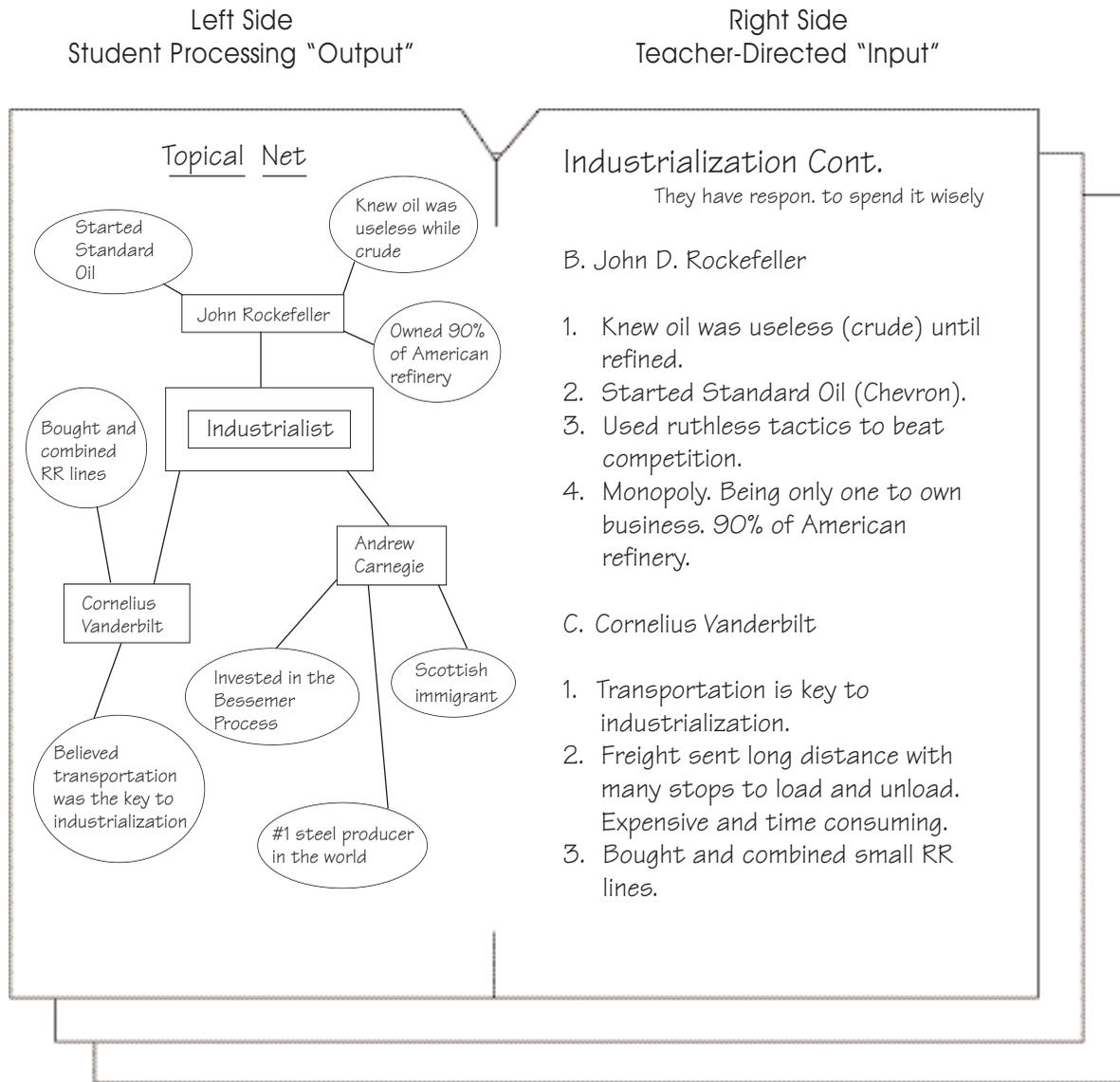
The power inherent in most visual tools is the capacity to support individual learners in transforming what otherwise would be perceived as strictly linear experiences, text and data, into a more expressive visual pattern—sometimes linear and other times nonlinear—that more deeply reflects the holism of the concept. When a stu-

dent drafts a visual expression, he or she is forming the static information into knowledge, much as a sculptor transforms a dead block of clay into a life-full image. So often we give students lifeless blocks of clay in classrooms, and they turn them back to us *in the same form*.

An exemplar of transformative visual tools—which *every* student could immediately use and gain from—is found in the History Alive! program (Teachers' Curriculum Institute, 1994). Although this program brings history to students through activities and discovery units that employ multiple intelligences, students synthesize their work using a range of visual tools. They create Interactive Student Notebooks (see Figure 7.1). On facing pages in students' notebooks, the right page consists of teacher-directed input, which may include handouts, linear notes, and outlines. On the left side, students transform the information provided into a full range of visual tools shown in this book, and other representations of their thinking. This explicit focus—seeing with two eyes—creates a dynamic environment in the classroom for honoring both what the teacher is

FIGURE 7.1

Left Side/Right Side: A Student's Interactive Notebook





presenting and the expectation that students will transform this new information into a new form.

By being able to step back from a visual representation and see “the larger view,” learners and teachers can make richer inferences, interpretations, and understandings. The “more restricted view” may be held in the lines of linear text and spoken language. When using a creative web, an organizer, or a map, a student is in the process of changing the actual form of the information, transforming and constructing the information into knowledge by his or her hand.

This split perspective opens a classroom to multiple perspectives. Unlike any other period in the history of humankind, learners of today must be able to see that as they are looking down on their maps, they are looking at only one perspective, one mental model. In the culturally diverse, information-rich, high-end communication world, students must see that mental models are

like a pane of glass framing and subtly distorting our vision; mental models determine what we see.

Human beings cannot navigate through the complex environments of our world without these cognitive mental maps, and all these maps, by definition, are flawed in some way. (Senge, Kleiner, Roberts, Ross, & Smith, 1994)

Without this critical perspective on mental models—and an understanding of the beliefs, values, and assumptions that frame mental models—visual tools for mapping our ideas will merely become another set of worthy tools for the teacher or student toolkit, rather than transformational tools for learners for reflecting on the processes of change.

## Changing Organizations

As educators—and organizational leaders—we now understand that the individual learning is

intimately tied to organizational learning. What is change in an organization? Cooperative learning in classrooms and collaborative working teams in the business world now are the norm rather than aberrant behavior. Change within these new parameters now relies on every level of the organization rather than only the top decision maker of the hierarchical organization. And, much like the mental models of the individual, group norms or mind-sets, theories-in-use, or schemata drive thinking and decision making in organizations:

Organization members frequently negotiate

specifically *organizational* schemata. Such negotiations allow participants to have a common orientation toward events. Organizational schemata, therefore, generate shared meanings or frames of reference for the organization as a whole or for various subgroups within it. (Bartunek & Moch, 1987, p. 486)

A similar requirement of visual tools as change tools for the individual applies to organizational change. While this book is primarily about learners in classrooms, change in whole school communities (including students, parents, teachers, administrators, school board members, business community, and community leaders) now depends upon a sharing of the common and unique patterns of thinking of the members.

Unfortunately, in classrooms, whole schools, and in businesses, change is often a mere reinforcement of present patterns. As Bartunek and Moch describe it, this is *first-order change* (see box on p. 128). Sometimes change agents work with a faculty to facilitate the actors in identifying the mental models that are influencing their actions. They also help identify the existing decision-making process that drives change, and their mental models for perceiving assessment or “change processes” in their classrooms and across their school. This is all *second-order change*, as

participants may make shifts in perception and behaviors according to these realizations.

Rarely, though, does an organization such as a school faculty become fluent enough with the processes of second-order change to be able to surface their own mental models—on their own—and actively evaluate and transform these understandings into new models for actions. This would-be *third-order change*: a conscious

#### Orders of Change

First-order change: the tacit reinforcement of present understandings.

Second-order change: the conscious modification of present schemata in a particular direction.

Third-order change: the training of organizational members to be aware of their present schemata and thereby more able to change these schemata as they see fit.  
(Bartunek & Moch, 1987, p. 486)

and continuous process of expressing and transforming patterns of thinking and behaviors. (For a recent analysis of orders of change, transitions between orders, and implications for schools, see Zimmerman, 1999.)

I believe that even though we do not yet have the concrete “change tools” and processes to adequately engage in third-order change, this is exactly the direction we must go toward. I also believe that the visual expression of mental

models will be a key ingredient in this process. Why? Given a deeper understanding of visual tools as explicit ways to surface mental models, these maps become holistic forms for members to show the patterns and thus holism of their ideas (schemata) of learning communities to make change on their own.

## Schoolwide Change

This *Field Guide* could have started with the following story of a school that is in the process of becoming part of a larger community of learners through the support of visual tools. Change is hard, and this school has certainly struggled with the same demons that confront every school: forces within and outside the school who, for whatever reason, resist change. Jeffrey Spiegel, the school’s principal, offers this vision of his school, a school reflecting on its own process.

## On Becoming A Metacognitive School

BY JEFFREY M. SPIEGEL

*The Greek have a word, metanoic, which when translated means fundamental shift of mind. At Hanover Street School (HSS), an elementary school in Lebanon, New Hampshire, students and teachers are considering new ways to think about thinking and integrate their discoveries into how teachers teach and students learn.*

*At first blush HSS looks like an ordinary public school. Students gather on the playground prior to the school day to converse, play on the new climbing structure, and see who can reach the greatest heights on the swings. Like most schools, the hallways offer a glimpse of HSS’s past and present. What distinguishes this school from others becomes apparent only when closely exam-*

ining some unusual representations of student work, which are also prominently displayed in classrooms and corridors.

Students are representing their cognitive strategies with visual tools called Thinking Maps. It is the school's way of practicing metacognition, a principle of learning that exists when children are able to describe the thinking processes they use to solve problems. In *Teaching With the Brain in Mind* (1998b), Eric Jensen suggests that explicit learning models should include rich graphic organizers because they can provide an informational context for greater understanding and meaning.

One surprising consequence of Thinking Maps implementation was that teachers began discussing with students how to think about thinking. This dialogue represented the school's initial step to a new level of understanding about the learning and teaching process. Unbeknownst to many teachers, when students began describing strategies they used with Thinking Maps, they were embarking on a journey toward metacognitive development.

One display that captures visitors' attention in the 5th grade wing of the school is a rather large drawing (six feet long) by the class done with various color markers on blue construction paper. The title says "War," and below students created a giant Tree Map with branches that listed such categories as Causes, Results, Types of Warfare, Locations, and Weapons. Some subtopics were Transportation, Shelters, and Groups of People. As many as 30 examples appeared under each category.

In a 3rd grade classroom a depiction of bubbles emanates from a central circle with the words My Community inside. In the outer circles of the Bubble Map, students describe the local hospital, library, recreation center, and a host of other neighborhood resources and establishments.

These Thinking Maps demonstrate some of the many ways in which children in different grades and responding to various subject matter

were able to organize information and visually represent it to others. Thinking Maps are not only an effective tool for classifying information and identifying problem-solving strategies. Additionally, they are effective communication and assessment tools that depict how children think and make sense about what they are learning.

Thinking Maps represent the common visual language teachers and students have been using to generate and organize ideas, to reflect on sequences of events, to characterize and contrast story elements, as well as to identify causes and effects of such varied topics as science reactions, pollution, slavery, or even discipline infractions. Students have created Brace Maps that describe physical parts of Aztec Shields, and Bridge Maps that show the relationship between book authors' styles and artists' techniques by way of analogies. This higher-order thinking by students represents a deeper understanding of curricular content that has surprised many teachers and parents.

The faculty at HSS now have a way to bridge curriculum with state-mandated outcomes commonly referred to as Frameworks. As in most states, the Frameworks identify curriculum standards and proficiencies for all subjects specific to each grade level. Students at HSS can display the thought processes they rely on to prepare writing prompts, solve multi-operational math problems, or describe relationships ranging from competing story protagonists to contrasting historical events that appear on the state Frameworks tests.

More impressively, Thinking Maps have provided new pathways for children to think at higher levels. Some students are becoming so adept with the maps, they no longer draw them. As one 6th grader remarked in a class meeting, "Instead of putting the map on paper to organize my thoughts, I can picture the map in my head and come up with the information right away."

Thinking Maps provide opportunities for students and teachers to talk about thinking and to



work together to integrate their discoveries within the context of varied topics. Often, during the initial year of using them, students were able to create and apply innovative uses of the maps. This phenomenon was exciting and dynamic. It meant that students were not only in charge of their learning but that, in some classrooms, they were driving the instructional practice. This experience parallels Plato's concept of "educare" and the current movement focusing on the social nature of learning.

The use of Thinking Maps represents the cognitive side of metacognition. Students are now better able to describe their thinking strategies and apply them to traditional academic tasks.

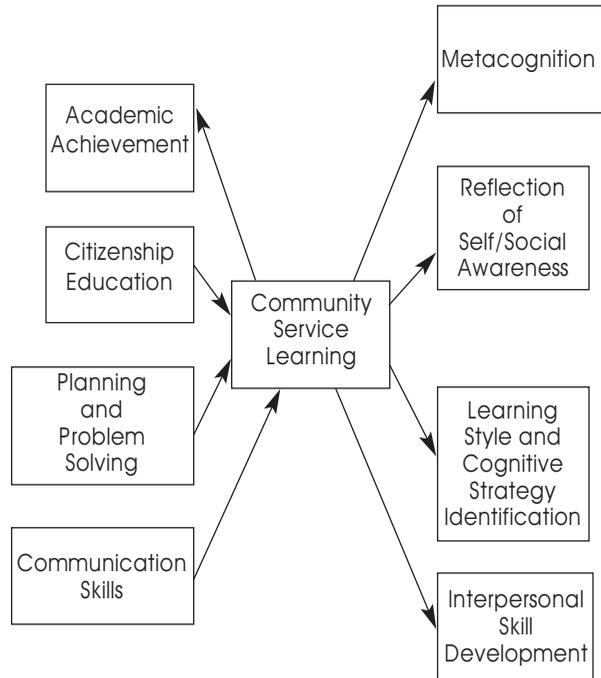
Although Thinking Maps have been integrated into the curriculum, it is only the first step in HSS's efforts to create a metacognitive school. This past year the faculty and administration asked themselves, *If Thinking Maps represent the cognitive side of metacognition, what then, constitutes the meta or experiential side?* The answer: *Community-Based Learning (CBL)*. CBL is composed of five primary organizational components: planning (assessment/essential questions), preparation (resonance with curriculum), action (implementation), reflection (evaluation), and recognition (social development). The Multi-Flow Thinking Map shown in Figure 7.2 describes some social causes required by academic standards and the effects of CBL on them that ultimately arrive at metacognitive learning. The map also provides a visual explanation of the relationships and interactive components that characterize a metacognitive school.

### Understanding the Developmental Process

The Lebanon Food Coop Service Learning Project, initiated by 5th grade teacher, Sarah Curtis, represents one example of the professional growth process that characterized the integration of CBL and teacher development at HSS. Sarah responded

FIGURE 7.2

### Multi-Flow Thinking Map



to the schoolwide effort to investigate, develop, implement, and evaluate the effectiveness of her class's CBL project as part of her staff development plan for the year.

The Food Coop Project resulted in the class's inquiry about the historical development of cooperatives dating back to the Rochdale Cooperative in early England. Students studied documents about the formation of the Lebanon Food Coop, and, based upon their research and discussions, performed a play written by Sarah at the cooperative's grand opening in the fall.

An analysis of the Food Coop Project, conducted by the New Hampshire State Study Group on Community Service Learning, revealed a number of significant findings. Consistent with other



classroom first-time experiences with CBL, the Food Coop Project was teacher driven and lacked a formal reflection process for students. Furthermore, discussions with teachers revealed that they either did not know how or were initially reluctant to empower students in the planning process. While students spent many sessions exchanging ideas about their experiences, the process for student reflection in most cases was not formally defined. As a result, students focused more on what they learned personally from their CSL activity and less on describing the mental strategies they used to address a community-based issue.

Emerging from the Food Coop study was evidence that the teacher was adept at using Thinking Maps to assist the class in defining roles, organizing materials, and determining goals for the project. Students participated enthusiastically, applied academic skills, and gained historical, environmental and social perspectives about a business's responsibility to its community. Students also received positive recognition from local residents and, more important, influenced families to become Coop members. The play they performed was filmed, and the video has now become a permanent fixture in the Coop's lending library.

The Lebanon Food Coop Project and other CBL class projects were innovative practices intended to broaden the context of learning for students, teachers, and community partners. Metacognitive schools create conscious, self-directed thinkers able to discover meaning through reflection and community experience. Thinking Maps and CBL experiences encourage students to reflect on their work critically and creatively so that learning becomes a deeper and more intimate process.

### Metacognitive Teaching as a Developmental Process

CBL was not an entity separate from the conditions of learning and teaching at HSS. As the fac-

ulty discussed their CBL projects, they increasingly realized that this type of activity was a vehicle for learning how to plan instruction and how to think. Currently, the faculty is redefining the school's mission as a place for learning. It is what some in the literature have characterized as school development; namely "the process by which members of an institution develop the capacity to reflect on the nature and purpose of their work together" (Stewart, Prebble, & Duncan, 1997).

The initial experiences with Thinking Maps and CBL demonstrated that a developmental process described teachers' integration of new and provocative instructional practices. Based upon their experiences, teachers reconsidered the implications of the instructional planning process. In particular, they focused on the role assessment plays in unit study development.

Teachers began their discussions by considering their Thinking Maps experiences. Introduction and use of a new approach to teaching represented a developmental process of integration.

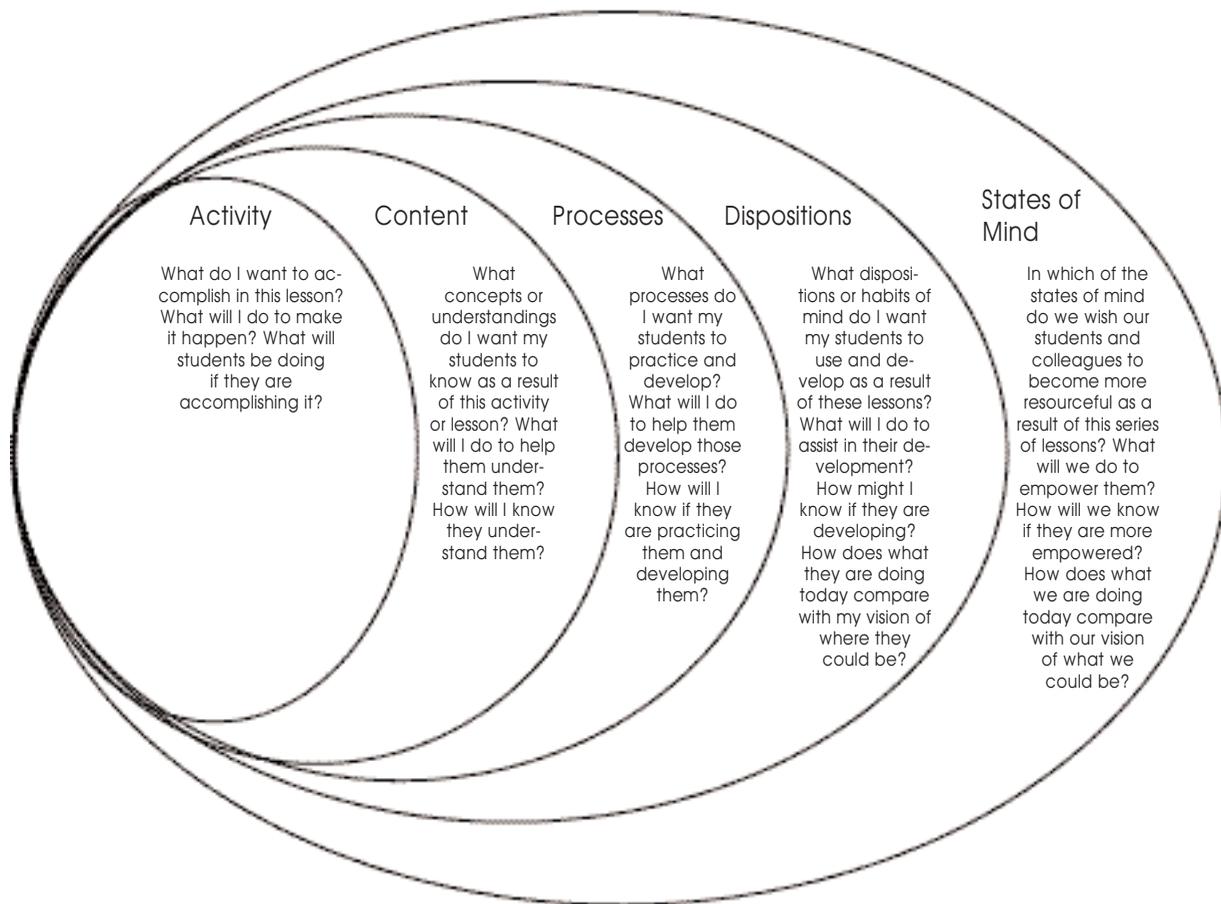
Teachers define assessment as the formative collection(s) of evidence(s) of learning. Assessment required a conscious plan to develop essential questions to guide the unit study and to determine what kind of student work would be assessed and with what formats (e.g., rubrics, formal tests, reports, projects, etc.). Assessment was distinguished from evaluation, which was defined as the analysis of the assessment evidence and the subsequent instructional reflection and planning with students that resulted.

### Conclusion

Annually, HSS culminates the school year with a Celebration of Learning: an opportunity for the parents and local community to observe how HSS aspires to be a quality school. This year, for the first time, classes and community partners presented their CBL projects. It (1) represented a fundamen-

FIGURE 7.3

Maturing Outcomes Reflect Teachers' Growth



Source: Costa, A., & Garmston, R. (1998, Spring). Maturing outcomes. *Encounter: Education for Meaning and Social Justice* 11(1), 11. Copyright © 1998 by Psychology Press. Reprinted with permission.

tal or “metanoic” shift in how students are involved in the educational process, and (2) dramatized the first step by a school to encourage mutual learning through shared teaching by children and adults. As this powerful metacognitive environment slowly emerges and such programs as CBL and Thinking Maps are woven into the fabric of every classroom’s educational program, HSS moves closer to becoming

a learning community that, no doubt, will have even greater cause for celebration.

### Shifting States of Mind

One way of looking at this *Field Guide* and the implications for change over time is through the



lens developed by Art Costa and Robert Garmston (1998), with support from their colleagues. This model is one of maturing outcomes as a teacher grows over his or her career from reflecting on the outcomes of a specific activity, to seeing that the cumulative effect of activities are embedded in more comprehension, lifelong outcomes for learners (see Figure 7.3).

The activities we construct for students are embedded in layers of content and grown through natural processes. There are more inclusive and important questions that must ultimately frame and influence how these daily activities of content and process are formed. As Costa and Garmston

ask: What are the habits and states of mind that we wish to develop in learners that will empower them to become aware of their own minds so that they can nimbly shift their own minds?

To do this, learners of all ages must be able to honestly reflect on their own thinking, to become aware of the patterns that seem to work, and to see how many patterns become lifeless, repetitive, unchanging, stubbornly unchangeable. Visual tools of all kinds provide pathways for learners—lifelong—to look inward, see, and then share with others how they are thinking. Thus, they can provide a visual pathway from where they are to a new vision of what could be.