

7

Systems

Editors' Introduction

It is extremely difficult to make significant changes in a school—to take that fork in the road away from generational norms in an educational paradigm—based on project trends for the needs of future generations. It seems especially difficult when we realize that with information technology, dynamic social media, and global travel, as Neil Postman pointed out decades ago, “change has changed” and that a child born today may well live into the 22nd century. It is even more difficult for a whole school system to make significant shifts in direction when representing a larger community and thus multiple schools. The superintendent’s leadership team of East Minoa Syracuse School District in upstate New York, including the authors of this chapter, garnered the support from their schools over time and made changes that improved learning and teaching in their system. They began by implementing Thinking Maps as a new set of tools over 3 years from pre-K to graduation. They could have been satisfied with the growth at this first order of change. But after seeing that wider field of education was calling for a dramatic shift toward “21st-century learning,” they realized that the change they really needed was at a completely different level.

So they began investigating “thinking” as a foundational pillar for “learning” in their classrooms. If 21st-century learning is about the 4 Cs of Critical thinking, Communication, Collaboration, and Creativity, had they implemented Thinking Maps for these purposes or merely for improving outcomes based on those established by a 20th-century paradigm for learning? Thus the animating question of their experience and of this chapter is an ongoing enquiry and a question for us: What is the relationship between learning and thinking?

Donna DeSiato and Judy Morgan engage us in their “school system” story that reflects what Richard Coe surfaced for us in the previous chapter in how his individual school shifted over time. While this story of transformation offers an avenue for understanding the ideal of Thinking Schools, the authors also take us outside the classrooms of their schools and into the courtroom. This chapter ends with an engaging story of the practical transfer of thinking processes and complementary tools from the school system into the judicial system. The question of the difference between “learning” and “thinking” is answered by a real-life parable. The capacity to develop thinking carries into our adult lives, and how we think drives the way we solve problems and make life-changing decisions.

A SYSTEM-WIDE VISION FOR THINKING

Dr. Donna J. DeSiato, Superintendent

East Syracuse Minoa Central School District

Judy Morgan

New York State ASCD President

As educators, we often say that we believe all children can learn and improve their abilities to learn. Do we believe all children can think and improve their abilities to think? What is the relationship between thinking and learning? What do thinking and learning look like in our classrooms?

In summer 2005, as we grappled with these questions, we convened building and district level leaders to analyze our student achievement data. The analysis of the data revealed a 6-year trend of mid-range scores in English Language Arts (ELA) and math. Despite the hardworking efforts of many, a significant gap existed between the abilities of our students and their performance. Dissatisfied with these results and determined to change this bleak pattern, we asked ourselves: What action needs to be taken to change the results of student learning in a positive direction? Searching for solutions and seeking to better understand the world we are preparing our students for, as a leadership team, we read *Good to Great* by Jim Collins and Thomas Friedman's *The World is Flat*. Inspired by these writers, we reflected on how to best prepare our youth for a complex, interconnected, changing world, which led us to explore the impact of explicitly focusing on thinking toward the improvement of student learning. We reasoned that our students are facing an ever-increasing content knowledge base through a range of technologies and a future that envisions the need for people in college and the workforce to be highly adaptive, collaborative, self-reflective, creative, and analytic.

As we confronted the brutal facts of student achievement, we recognized the need to clarify our goals, identify research-based effective practices to address the learning needs of our students—for the present and future—and to engage our stakeholders in the process. We also realized that we needed to implement these practices systemically. We began with three district goals to focus our work on student learning and achievement, as well as to measure our results:

Goal 1: Increase student achievement through high expectations supported by consistent, comprehensive focus on teaching and learning.

Goal 2: Increase student achievement by building capacity within the system to support and nurture a continuum of learning through the implementation of research-based practices.

Goal 3: Increase student achievement by strengthening parent engagement and community partnerships to support learning.

As we embarked on a journey of continuous improvement in student learning, we introduced a District-wide School Improvement Planning Model. School Improvement Teams were formed in each school comprising teachers, instructional support staff, parents, and administrators. Our School Improvement Team leaders studied and integrated the research of Marzano, Pickering, & Pollack (2004) into plans designed to systemically implement strategies for improving student learning. The research affirmed that “effective teaching is a complex endeavor with many components” (Marzano, 2009), and the School Improvement Team members recognized that the selection and systemic implementation of research-based effective instructional strategies and tools were keys to improving student learning. As each School Improvement Team read and reviewed the research, considered the evidence and reflected on the needs of our students, Robert Marzano’s meta-analysis show conclusively that a key area for improving student learning is the focus on thinking processes such as identifying similarities and differences, the use of nonlinguistic representations, summarizing and generating hypotheses, and the capacity of students to work cooperatively. The research also reflects what we knew about “great teaching”: the capacity within and across classrooms for teachers to provide high-quality feedback, use higher-order questioning, and use cues and advanced organizers to meaningfully engage the students in learning.

While most any single teacher may point to their isolated use of these key findings from Marzano’s meta-analysis, we were increasingly aware that students needed a consistent, year-to-year approach to improve their own learning and thinking. Through our search for proven approaches that integrated these key findings, we discovered that Thinking Maps was a model of visual tools for improving student learning in our classrooms while explicitly focusing on the student-centered development of thinking. As a leadership team, we recognized that Thinking Maps provided our teachers and our students with a common language, a set of tools and visual patterns for organizing information and thinking meaningfully about their learning, while also focusing on questioning based in cognitive processes and collaborative work. This, we believed, could lead us to improved student achievement.

We observed positive outcomes across the district as the maps were thoroughly introduced to all teachers at all grade levels within the first 3 years of implementation.

The implementation design consisted of systematic follow-up, sharing of student and teacher work, training of experts in each school, and an immediate focus on using Thinking Maps for content learning and lesson planning. The initial results in student achievement were impressive, and our elementary schools and our middle school were recognized for significant growth. In a letter written to the principal of each of our schools, then New York State Commissioner of Education, Richard Mills stated, “You and your entire school community are to be commended for leading New York forward to accomplish our dual goals of increasing student achievement while closing the gap in student performance.”

Figure 7.1 English Language Arts State Standards Comparative Data

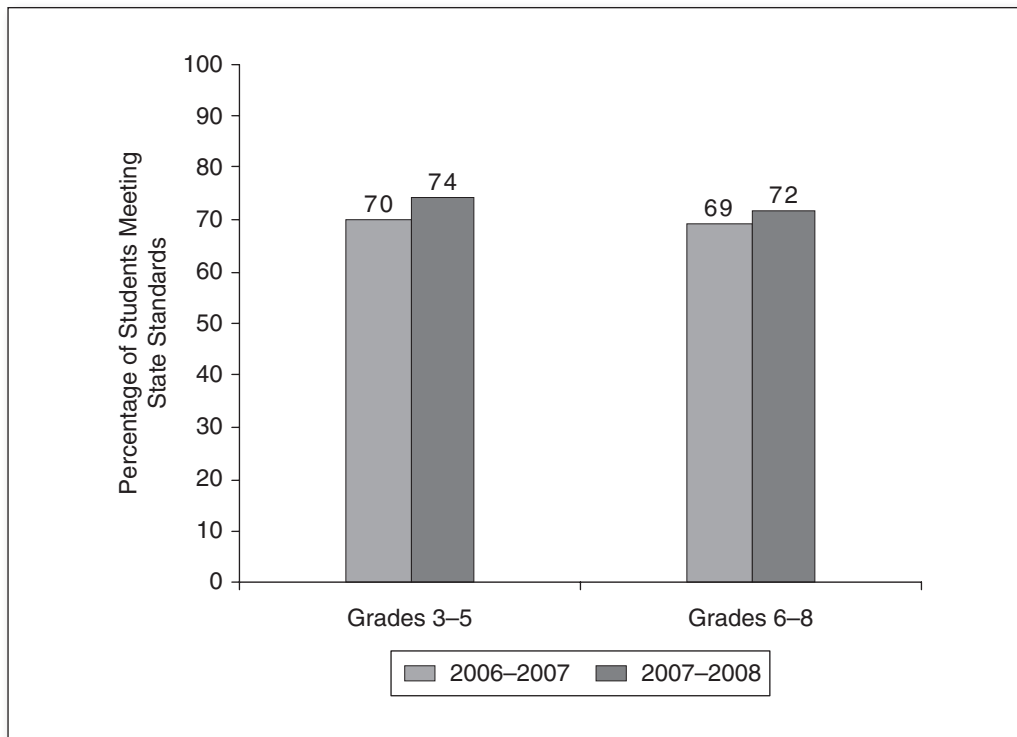
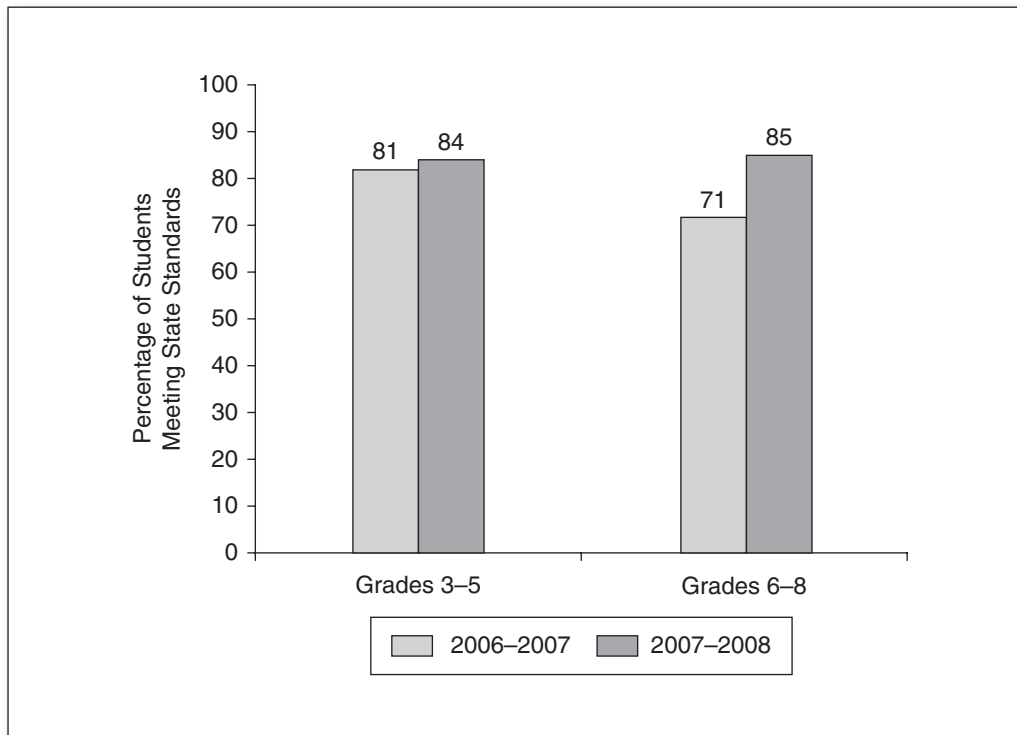


Figure 7.2 Math State Standards Comparative Data



THINKING IN THE 21ST CENTURY ■

While the positive gains in student achievement were notable after these years of implementing Thinking Maps, we recognized the need for improvement and plans were developed for continued growth. As our district embarked on the development of a 5-year strategic plan, we departed from the traditional paradigm of improving the current system. Most often the focus of strategic planning is to strengthen or modify what currently exists. This is first-order change: improvement within the existing paradigm. Certainly, we believe in continuous improvement; however, to embrace the challenges, changes, and opportunities of the 21st century, we discovered that we needed to go to a second order of change: We needed to go beyond our existing system and our current paradigms, which led us to the exploration of what many in the field are now calling *21st-century skills*. This is when we truly shifted from a focus on “improving learning” in a traditional sense, to enabling our teachers to teach for “improving thinking” as well.

Thinking is at the center of 21st-century learning in the shift from mastery of content through memorization and recitation toward internalization of content through application involving problem solving; critical, creative and innovative thinking; communication; and collaboration. Frank Kelly, Ted McCain, and Ian Jukes (2009), in their book *Teaching the Digital Generation*, state that “learning must focus on 21st-century thinking skills” (p. 38). These authors point out that “assessment must encompass both knowledge skills and higher order thinking skills,” and they underscore that “assessment of higher order thinking skills must be an integral part of the teaching and learning process” (p. 41).

As we integrated Thinking Maps into classrooms pre-K through Grade 12, our initial intent was to strengthen student learning in the content areas, which happened and reassuringly reflected Marzano’s findings about the effects of focusing on key variables as noted above. It was only after the introduction of the idea of 21st-century skills that it became evident that we had not fully used the maps for thinking but primarily for the organization of content knowledge and academic vocabulary toward the goal of improved learning.

But is “learning” within the existing paradigm of teaching, learning, and assessment the same as the development of “thinking”? We questioned: What is the relationship between thinking and learning? What does thinking look like in our classrooms? It became obvious to us as we viewed the use of Thinking Maps in classrooms by students that, by and large, the maps had been integrated across our schools as simply the next generation of “graphic organizers” for organizing and displaying information and had not also risen to the level of application for which they were intended: promoting higher-order thinking. We were still at the first order of change—improving the existing structure within a 20th-century paradigm—and we knew our students of the 21st century needed to go dramatically deeper.

This discovery opened up a multitude of opportunities for exploring and expanding our efforts of improving student learning and student thinking simultaneously using the same tools. In the years that followed the systemic

implementation of Thinking Maps as students' progress from one grade to the next and from one area of content to another, the students now consistently apply the eight Thinking Maps as an integrated set of tools for thinking, not just for learning in the traditional sense. Teachers began abandoning a variety of static, disconnected graphic organizers. They slowly let go of these isolated graphics as simply useful for isolated tasks to empower students with "thinking process" tools that concretely transfer across disciplines and through to the eight to 10 different complex jobs they will have over their lifetime. The focus widened to engage students to be active participants in their own learning by explicitly promoting their thinking.

As we developed our next Strategic Plan, we asked the question: What does East Syracuse Minoa (ESM) need to do to shift our educational system to align with the skills needed for success in the 21st century? As we collaboratively examined and reflected on our current practices of teaching and learning, supervision of instruction, and assessment of and for learning, we realized we needed to plan for changes in our system that would integrate 21st-century thinking skills development with the evolution of high-quality teaching and high levels of learning. As we refocused on realigning and strengthening our learning organization, we discovered that we already had the tools needed to enhance, facilitate, and assess critical thinking, problem solving, collaborating, and communicating in Thinking Maps. Along with a strong foundation based in cognitive processes, we also needed to develop dispositions for thinking, high-quality questioning, collaboration, and inquiry. But we were not yet fully implementing the maps to achieve these outcomes. Why not? We realized that to accomplish this, all our leaders would need a deeper understanding of Thinking Maps, their use and application across the curricula, as well as for modeling and applying in their leadership practices and providing meaningful coaching and feedback to teachers in their use of the maps. (Editors' note: See Chapters 9 and 10 for coaching and leadership using Thinking Maps.)

As we planned for our annual leadership institute, we integrated 2 days of professional development grounded in the training guide, *Thinking Maps: A Language for Leadership* (Alper & Hyerle, 2006). All our administrators and supervisors at the building and district level were fully engaged and actively participated in this learning for leadership development facilitated by the same consultant who had trained our district-level professional developers for preparing our teachers to use the maps with students. The feedback during the 2 days and follow-up support affirmed that these new visual tools for promoting and organizing thinking were relevant, meaningful, and applicable to all areas of leadership within our district.

Launching the next school year, Thinking Maps became not just our "tools" of choice. Now, students, teachers, principals, and central office leaders were all using a *common language* for thinking and improving our thinking from pre-K children to the superintendent, school board, and community members. The use of the maps to promote thinking and visually communicate began to more deeply permeate our learning environments, exemplified in variety of meaningful ways such as a Tree Map to classify areas needing improvement in a teacher evaluation and a Circle Map to define enhancing staff development in

the area of wellness for students, staff, and parents. Our Deputy Superintendent Dr. Thomas B. Nevelndine summarized the systemic training in and use of visual language across our learning organization:

ESM made a commitment to implement thinking maps through extensive professional development and support for practice at all levels of the system. The uses of Thinking Maps are invaluable in working with a variety of school personnel and community groups to produce meaningful outcomes. The process has an understandable logic and provides a roadmap for engaging participants in dialogue around critical issues, providing a visual representation of their thinking. Using the Multi-Flow Map for cause and effect was especially helpful in working with a Citizen's Advisory Committee (CAC) as we analyzed the structure of the school day. This particular thinking Map was invaluable in analyzing the benefits of 21 distinct transportation and bell schedule options.

Throughout the district, the use of Thinking Maps shifted from

What map do we need to use?

to

What thinking do we need to solve this problem, deepen our collective understanding, or to develop shared understanding and create new knowledge?

Kathy Southwell, ESM's Director of Teaching and Learning, shared her experience using the maps for the implementation of our Strategic Plan. Her comments directly reflect the shift from using an isolated map in an episodic way toward investigating and focusing on the thinking that surfaces in the high-quality, day-to-day decision making that is required in any school system by different stakeholders to address our complex needs:

In order to meet our district's vision, we are striving to effectively plan and implement significant educational change. As the facilitator of the Academic Excellence and Rigor Action Team and Subcommittees, I truly believe that the use of Thinking Maps has helped the synergy of ideas, created highly developed recommendations for change, and organized effective implementation plans.

The Tree Map is the work of the Academic Excellence and Rigor Action Team in the 2nd year of implementation of our strategic plan. Teachers, parents, and administrators were starting to feel overwhelmed by the magnitude of the different action items for this group, with questions being raised regarding the connection of some of this work with other ongoing initiatives in our district. This map was created to organize our thinking under the district's vision, show the connection with the five district strategic planning action teams, and make a connection with the DuFour (2008) essential questions that have been widely used in our district to shape the work of our professional learning community.

Figure 7.3 Teacher Improvement Plan Tree Map

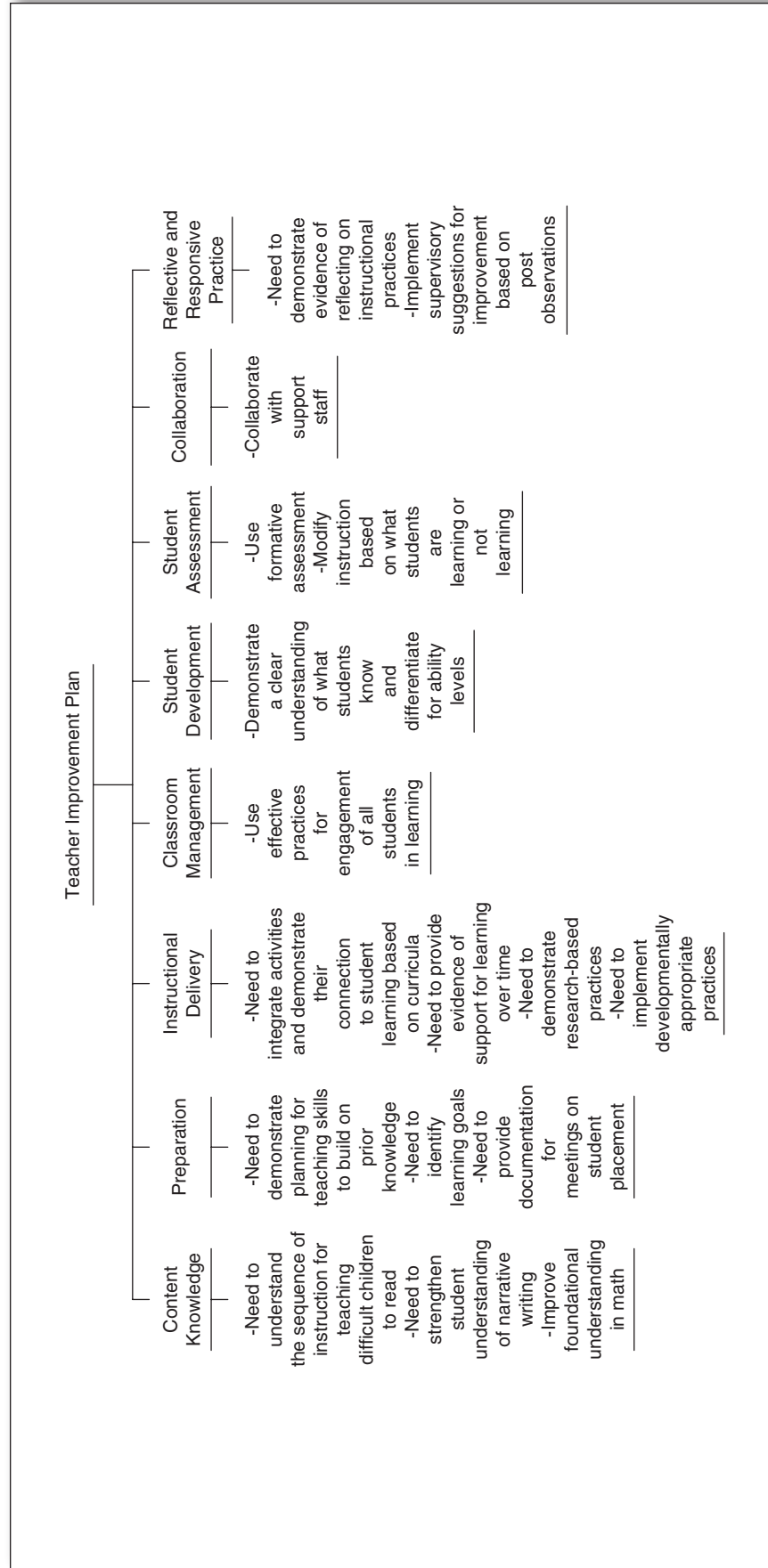
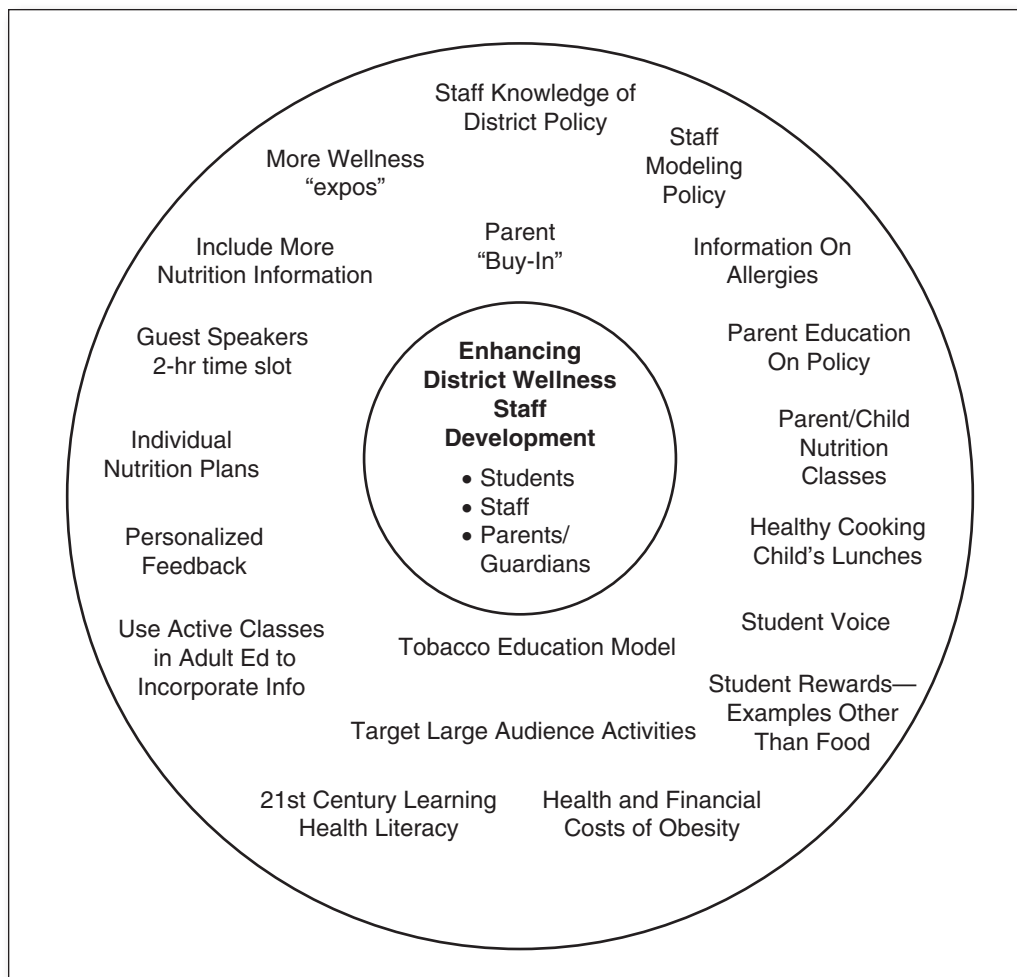


Figure 7.4 Circle Map for Wellness Staff Development

Once we established the structure at the top of the Tree Map, our discussion was rapidly focused and organized.

Ken Kay (2010), president of the Partnership for 21st Century Skills, stresses the importance of focusing on the 4 Cs: Critical thinking and problem solving, Communication, Collaboration, and Creativity and innovation. According to Kay, "fusing the three Rs with the four Cs is a national imperative." No longer can we focus solely on the recall and memorization of content. Our students need to know how to access information, ask questions, and apply their knowledge across content areas to make meaning, achieve deeper understanding, and create new ideas or knowledge. Thinking Maps become an essential tool for all 21st-century learners and citizens. Real-life experiences, with the integration skills of critical thinking, communication, collaboration, problem solving, and innovation, are essential for success in our global society. Ultimately, it is not the new technology, a new curriculum, or a reconfiguration of classroom walls that will make the difference. The outcome will be determined by whether or not students can independently and fluently applying thinking processes to

Figure 7.5 Citizen's Advisory Committee's Multi-Flow Map for Cause-Effect Relationships Regarding Structure of the School Day

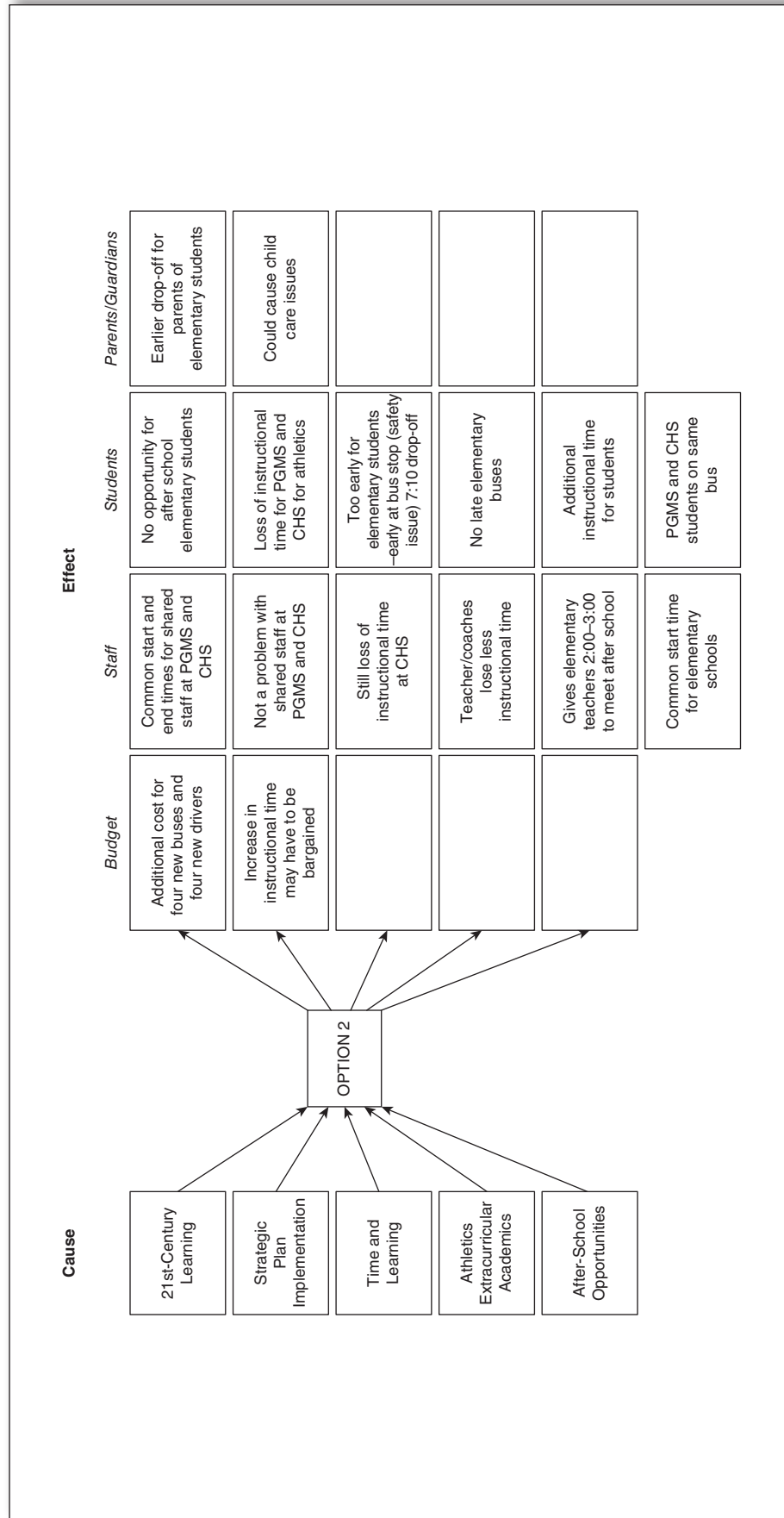
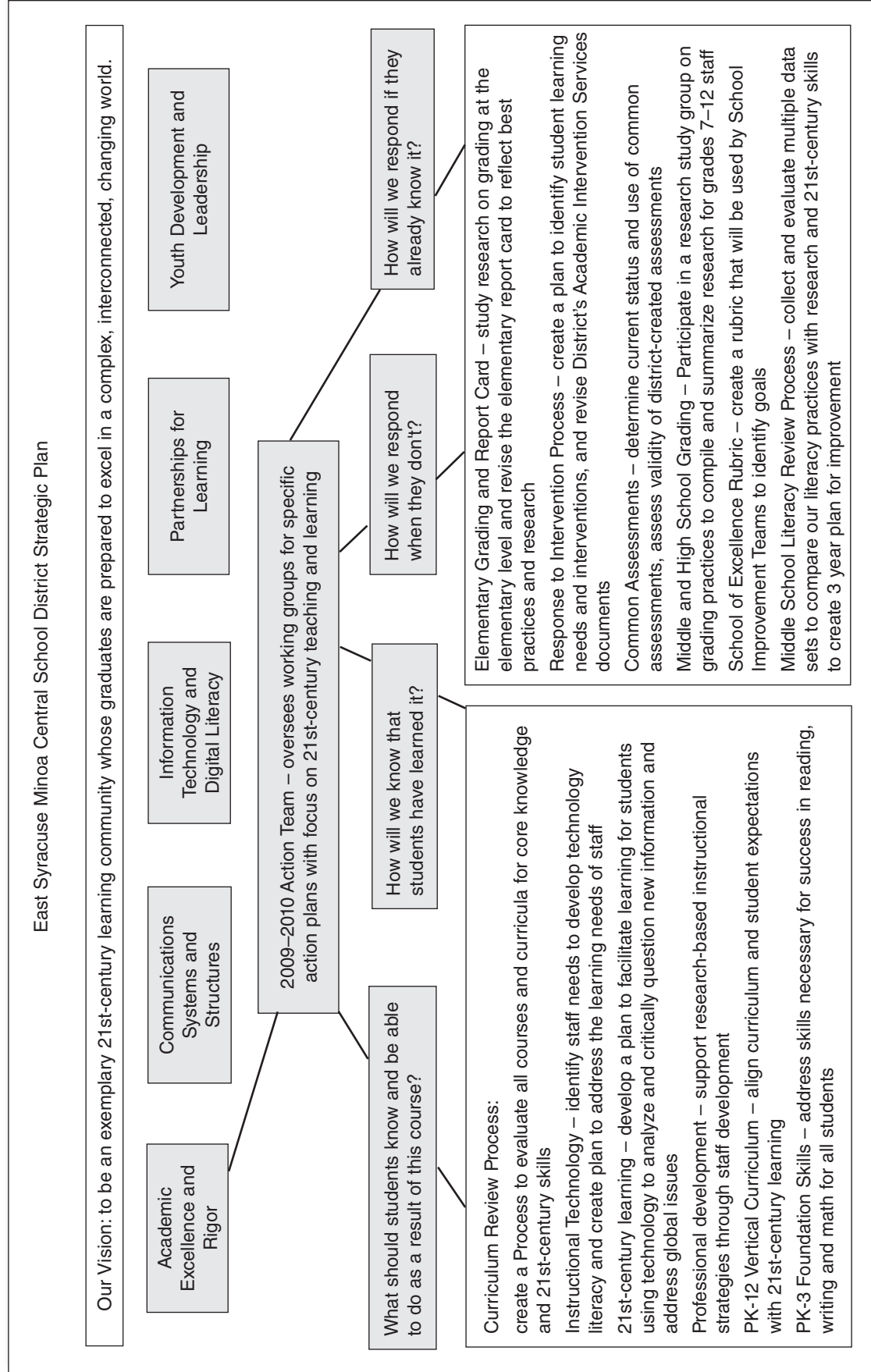


Figure 7.6 Academic Excellence and Rigor Action Team Strategic Plan Tree Map



problems, engage in sustained inquiry with others by creating their own challenging questions, and draw from a rich array of dispositions, or Habits of Mind (Costa & Kallick, 2000) that will bring about insights and discoveries we will need to solve 21st-century problems.

■ THINKING FOR DEMOCRATIC PARTICIPATION

Important to note, for the adult learners in our school system and wider learning community, the processes and approaches we use must carry some degree of transferability into our daily lives. If not, then how can we say in authentic terms that we are giving students tools that can be used outside the classroom? We have found that Thinking Maps are useful tools, not just in schools, but also in our daily lives. We, as citizens of our world, have a responsibility to make decisions that are mindful, reflective, and demonstrate responsibility for ourselves and others. This transferability is no better illustrated than in the story told in the real-life experience of Judy Morgan, then our Executive Director of Curriculum, Instruction, and Accountability, when she was serving as a juror in a court trial.

A fundamental dimension of democracy is that the representative form of government is an anchor in both political and judicial spheres. The decisions our students as future citizens make in the ballot box may only be rivaled by those they will make as jurors standing as peers in judgment of a fellow citizen. Judy was a district leader who had become fluent with Thinking Maps as tools of collaborative deliberation during important decision-making meetings about the future of our students. Then, as she conveys below, Judy stepped out of that role into a different setting with a similar dilemma: There are often no clear answers to complex questions that we must face throughout our lives as citizens.

As the judge told the 12-member jury that the decision was now in their hands, a sense of fear raced through one of the jurors. The reality began to set in. She was now in a position to determine the future for the plaintiff. Did she have enough information to make the decisions that needed to be made? After listening to testimony for 5 days, what did she really know about this case? There was just so much that had been said, so much that needed to be stricken from the record. What did she really know?

The jurors were escorted to a small room that was just large enough for everyone to sit around a table. This was the first moment that the jurors were allowed to talk about the case. No discussion had occurred prior to this time. The jurors represented the diversity of the community, young and old, inexperienced and very mature, male and female. The room began to buzz with random thoughts, several choosing to speak at the same time. As the one juror listened, trying to take in the essence of each person's interpretation of the sequence of events that had taken place over the past week, she began to ask herself, "What do I really know? How do I sort out fact from opinion? What was the real charge that we were given? How do I make a decision that will affect this person for the rest of her life in a way that is fair and based on fact?" Overwhelmed and confused, her mind was racing. Emotions were high. She knew that she needed to be able to make a decision that she could live with. At

a time like this, most of us allow emotions to cloud the issues. She had an overwhelming sense of needing clarity, but how could that happen?

The one thing that the jurors had in common was their desire to “do the right thing.” They realized that they held the key to the future for the woman on trial. What would prevail . . . emotions or the facts? How can a decision like this be made? Each of the jurors contributed thoughts about what made the person guilty or not. The one juror, not the foreman, tried to make sense of all the information and thoughts that were being shared.

Her mind was whirling, trying to connect thoughts and facts. It just wasn't coming together for her. She began to make connections as she began to organize information in her mind. She was trying to group and sort information. She needed to be able to organize what she really knew to be fact. She began to use a visual tool that she had learned as a school-district-level administrator. She thought, “Can I use the ‘school tool’ in this situation?” The jurors needed to regroup and work collaboratively. She decided that it was her turn to offer a strategy for them to think together. She asked the question, “What were we asked to do?” The group agreed that there were 5 charges that had to be taken into consideration. To her it immediately became obvious that she could assist the group by creating a Tree Map. Each of the 5 charges became the category headers. In an orderly manner, the group began to sort out the facts that supported each of the charges. It was amazing how this organizational structure changed the tenor of the group. Each person in a very thoughtful way contributed facts that could be easily sorted into the specific categories. Conversations among the jurors were thoughtful as they questioned a statement or asked questions that helped each member sort out fact from opinion. After about an hour of this organized fact gathering, the foreman asked for the data that was collected to be shared. As the facts were shared, it became very clear what the group knew. The foreman asked for a roll call vote. It was absolutely amazing that as each name was called, the response was GUILTY.

She was in awe of what had just happened. Chaos had been replaced with disciplined thought. Facts had been sorted out from opinions. Clarity had been accomplished through well-defined thinking processes using visual tools.

THINKING AND LEARNING ■

Let's return to our original question, focusing not just on schooling, but the complex and multifaceted dynamics of our daily lives: What is the relationship between thinking and learning? We still are not completely clear about the relationship between the development of students' thinking and what teaching and learning looks like. We are sure that we are on a path of discovering the interdependencies between the two. What is clear is that schools in this country and around the world may continue to teach for the mastery of information and low-level process learning, but this will not transform process thinking for our students of the 21st century. Given the circumstances of a highly competitive global economy and the dynamism of global interdependencies, we must challenge ourselves and students in a new way. We know that this century has placed new demands on how we teach and how students learn. Thinking Maps have provided us with the cognitive and metacognitive tools needed for the successful integration of 21st-century skills into high-quality teaching or what we in the field call *best practices*. Over the years, our students continue to demonstrate growth in student learning as evidenced by their performance on the New York State assessments in ELA and math, in addition to incremental increases in the graduation rate.

Figure 7.7 Student Performance: English Language Arts

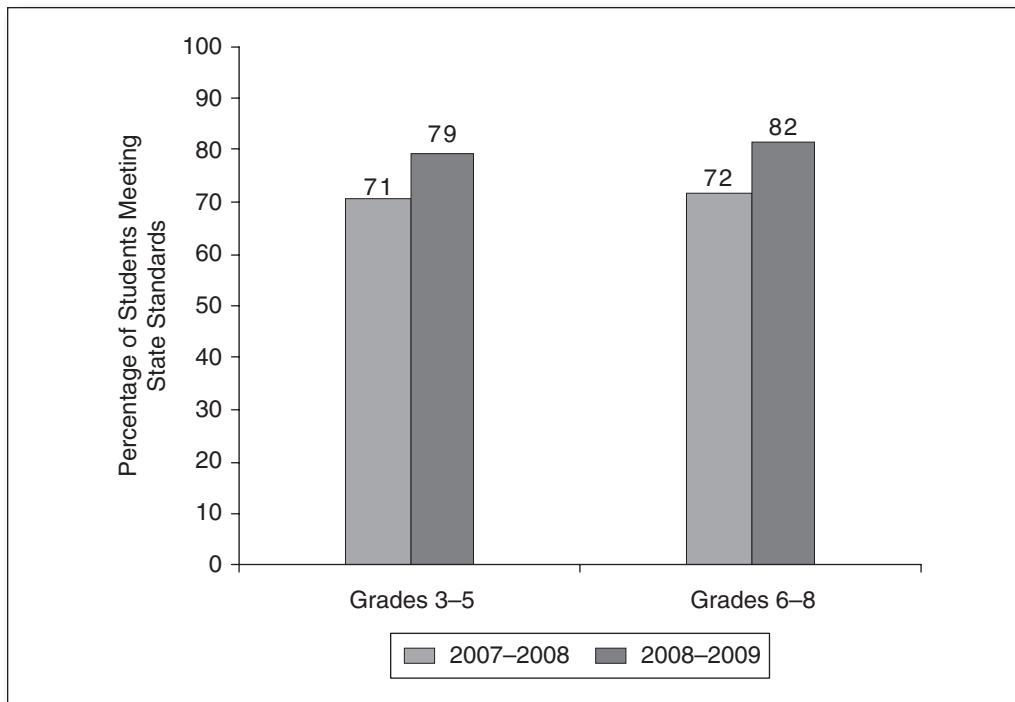
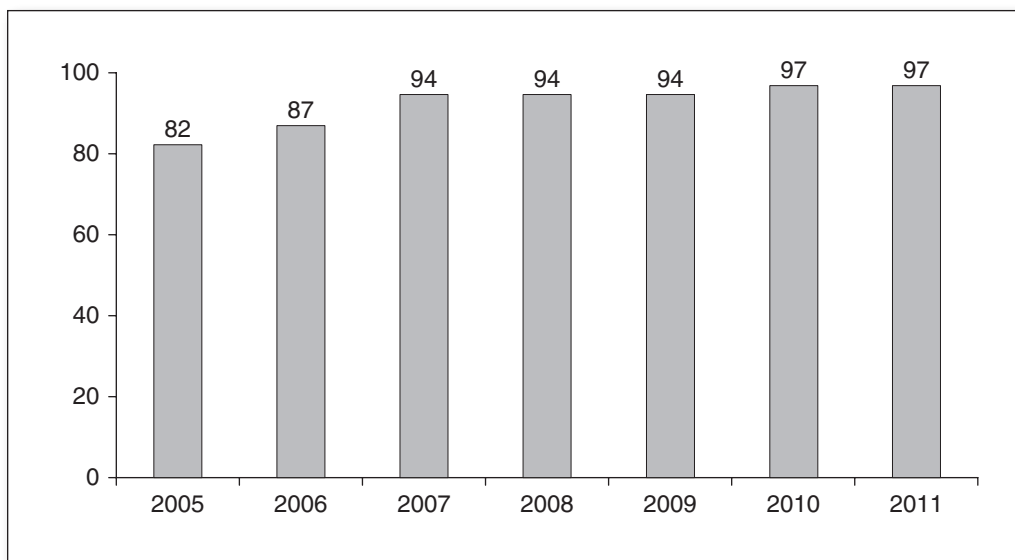
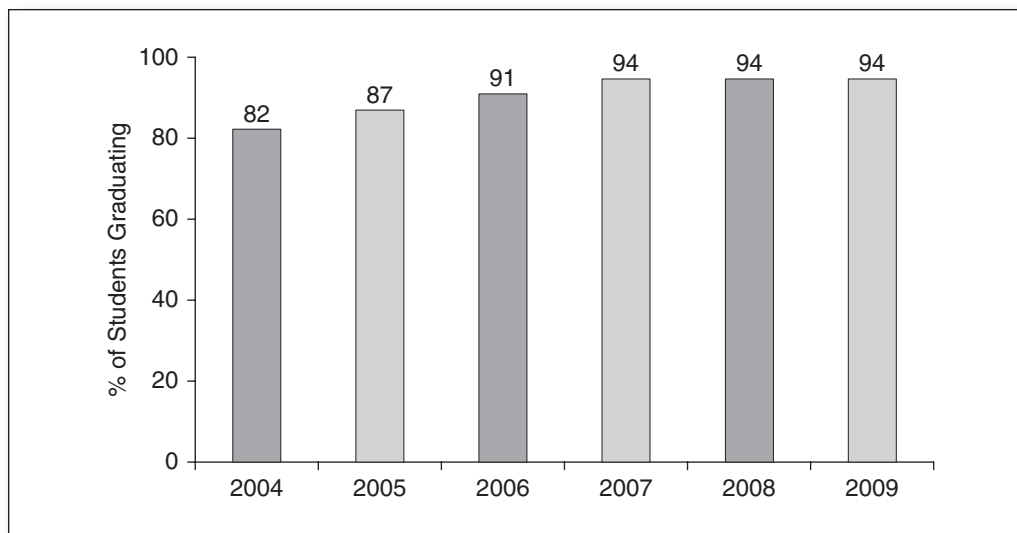


Figure 7.8 Student Performance: Math



Class of 2005, 2006, 2007, 2008, 2009, 2010 (2002, 2003, 2004, 2005, 2006, 2007 Cohorts) Including Regents, Local, & IEP Diplomas

If we want students to be self-directed learners, to work collaboratively, to explore areas through a creative lens, to explore innovative possibilities, then our schools and whole systems must be focused on the development of

Figure 7.9 ESM Student Graduation Rates

thinking. We must systematically and continuously give them dynamic, organizational, networking thinking tools that go beyond pure analytic reasoning and test-based, closed-answer assessments that focus on content and content-specific skills. Cultivating thinking is the focus of our work for learners at all levels, from consciously developing the dispositions for thinking and the quality of the inquiry in which we situate learning.

The East Syracuse Minoa Strategic Plan guides our decisions and actions toward our vision of becoming an exemplary learning community by preparing students for success in the 21st century. Now, more than ever before, the need to rethink how we are preparing our youth for the challenges and opportunities that lie ahead is critical. Facilitating meaningful, relevant experiences for our students is a powerful model for learning. All children in America—and around the world—need 21st-century knowledge and skills to become effective citizens, workers, and leaders in the 21st century. There is a profound gap between the knowledge and skills most students learn in school and the knowledge and skills they need in typical 21st-century communities and workplaces. To successfully face rigorous higher education coursework, career challenges, and a globally competitive workforce, U.S. schools must align classroom environments with real-world environments by integrating 21st-century thinking skills. Through our strategic plan, ESM is positioning itself to meet this challenge and answer the question: What does thinking and learning look like in our classrooms?

As Judy Morgan revealed in her collaborative decision making with fellow jurors, most problems in life are interdisciplinary, complex, and require clarity of thought and the dispositions of persistence, patience, and above all the capacity for thinking independently and reflectively as one thinks *interdependently* with others. The disposition and growing capacity for reflection, or metacognition—to think about your thinking—is essential to *how* we are as human beings. Judy was using the very same cognitive tools that we now see across our system, used by young children and graduating adults as citizens of the world.

QUESTIONS FOR ENQUIRY

Donna DeSiato and her colleagues committed to building a system for learning on the foundation of thinking. The authors identify their shift from first-order change to second-order change as a shift in focus to improving thinking rather than simply on improving learning. Clearly, they had their sights set beyond the classroom. What is the relationship between learning and thinking, and what are the ripples that such a shift in focus creates in our educational structures when a school or system commits to this pathway?

The authors assert that “the disposition and growing capacity for reflection, or metacognition—to think about your thinking—is essential to *how* we are as human beings.” The authors purposely chose the word “how,” even highlighting it for emphasis. The use of this word suggests that reflection is a dynamic state of being, although in our experience it is not always engaged in consciously. How can this disposition and capacity for reflection be supported in schools in a way that students become truly metacognitive, or reflective in action?

The idea of “interdependencies” is a recurring theme in this chapter as it relates to the new realities of the 21st century and the richly interconnected world in which we live. If, indeed, “change has changed” as Postman asserted, why is it imperative that interdependency—as it relates to content, ideas, and human interactions—be such a central idea to focus on as we think about re-forming the educational experiences for our students?

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