NAIS COMMISSION ON ACCREDITATION

A 21ST CENTURY IMPERATIVE

A Guide to Becoming a School of the Future

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Table of Contents

Making the Case for Schools of the Future 3

Essential Capacities for the 21st Century 10

Model Projects, Programs, and
Schools with Unifying Themes 13

APPENDIX A
Guiding Questions 36

APPENDIX B
Sample Process for Implementing a 21st
Century Curriculum: Prospect Sierra School 37

APPENDIX C
Accreditation Implications, New Model
Core Standard, New Criterion 39

Bibliography 39

About the NAIS Commission
on Accreditation 57

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Making the Case for Schools of the Future

The Society for the Preservation of Independent Schools As We Have Always Known Them does not really exist, but, if it did, its steadfast members would maintain that "the more things change, the more they stay the same."

Preservation advocates would argue vehemently that the enduring cultural and academic values of independent schools have stood the test of time, are immune to the latest "reform du jour," and best of all, present an immutable view of human nature and the development of human capacity, which is the best antidote available to calm the agitated currents and norms of 21st century lifestyles and a dysfunctional society.

Certainly we all would need to pause and reflect on our own lives these days, and we might agree that the frenetic pace, the multi-tasking, the "anytime, anywhere" race for expediency, makes us all a little crazy and may even qualify some of us for a new classification in the Physician's Desk Reference list of maladies.

And, of course, the disheartening partisan politics, the geopolitical unrest, the economic crises that plague all of us, and the lack of civil discourse and reflective thought gradually accumulate into a dreadful mixture of social and cultural pathology sufficient to induce an existential crisis and make us wish for a simpler, earlier time.

The case the "society" would make for preserving tradition, for framing 21st century teaching and learning as a continuation of already successful 20th century models, reminds us of conversations we are hearing from school leaders all across the country.

We have a perfectly excellent 20th century school; it works well, our college lists never looked better, our recent capital campaign went right over the top, and the trustees are reminding me that continuity and stability have been my strongest and most appreciated leadership traits. In fact, they just offered me a new five year contract with a deferred compensation package that is golden. The notion of "transformative leadership" simply does not fit into the vocabulary at this highly acclaimed school, nor am I comfortable with NAIS urging me constantly to become a "school of the future."

One of the goals of the NAIS Commission on Accreditation's Committee on Schools of the Future has been to reconcile what the literature suggests about the need for educational change and what heads of school are saying about the success of schools without change. The committee took into account the tension between tradition and innovation by engaging at the outset in an extensive research project involving a study of perspectives on all sides of the question.

We believe that everyone has an obligation to examine the research, ask for themselves what schools must do to prepare students for the future, and to adapt accordingly in ways that are consistent with the school's mission.

What Students Need to Know and Be Able to Do in the 21st Century

NAIS President Pat Bassett, in the Fall 2009 *Independent School Magazine* "Independent Perspective" article, describes what he calls "Demonstrations of Learning for 21st Century Schools," articulating, among other things, his discourse over the past year with a "handful of college presidents and school heads" now known as "The New Vision Collaborative."

Participants in this dialogue explored high quality options for a redesigned K-16 educational process capable of preparing graduates for the rigors of life in this new century, equipped with what appears to be an entirely new set of skills and capacities.

Their group has already composed the following first draft list of "demonstrations of learning:"

- Conduct a fluent conversation in a foreign language about a piece of writing in that language.
- Write a cogent and persuasive opinion piece on a matter of public importance.
- Declaim with passion and from memory a passage that is meaningful—of one's own or from the culture's literature or history.
- Produce or perform a work of art.
- Construct and program a robot capable of performing a difficult physical task.
- Exercise leadership.
- Using statistics, assess whether or not a statement by a public figure is demonstrably true.
- Assess media coverage of a global event from various cultural/national perspectives.
- Describe a breakthrough for a team on which you served and to which you contributed in overcoming a human-created obstacle so that the team could succeed in its task.
- Demonstrate a commitment to creating a more sustainable future with means that are practical and feasible.

Many schools have asked, "but what about the SAT?" There are now over 800 colleges in the United States that no longer require applicants to take the SAT. The *New York Times* recently quoted William Fitzsimmons, the dean of admissions and financial aid at Harvard, saying, "It would be much better for the country to have students focusing on high school courses that, based on evidence, will prepare them well for college and also prepare them well for the real world beyond college instead of spending enormous amounts of time trying to game the SAT."

Additionally, there is now sufficient evidence from the corporate, philanthropic, and military sectors to reinforce our argument. Tony Wagner from the Harvard Graduate School of Education interviewed over 600 CEOs, asking them the same essential question: "Which qualities will our graduates need in the 21st century for success in college, careers, and citizenship?"

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Wagner's list of *Seven Survival Skills* is a distillation of the outcomes of these hundreds of interviews and adds validity to the case we are making. They are:

- Critical Thinking and Problem-solving
- Collaboration Across Networks and Leading By Influence
- Agility and Adaptability
- Initiative and Entrepreneurship
- Effective Oral and Written Communication
- Accessing and Analyzing Information
- Curiosity and Imagination

The World Has Changed

In *The Global Achievement Gap: Why Even Our Best Schools Don't Teach The New Survival Skills Our Children Need – and What We Can Do About It*, Tony Wagner argues that "in today's competitive global 'knowledge economy,' all students need new skills for college, careers, and citizenship. The failure to give all students these new skills leaves today's youth – and our country – at an alarming competitive disadvantage. Schools haven't changed; the world has. And so our schools are not failing. Rather, they are obsolete – even the ones that score best on standardized tests. This is a very different problem requiring an altogether different solution."

Wagner's notion that "not even the best schools" are immune from his diagnosis is quite shocking, along with his argument that advanced technologies are, in part, driving a social and economic change of dramatic proportions.

The Committee on Schools of the Future researched this more thoroughly, including Mark Milliron's analysis that throughout history, technologies have had a dramatic impact on how we live and work and, yes, on how we learn. Milliron encouraged us to think of the tremendous changes attributed to the invention of the printing press. It revolutionized education. Today, new technologies are again having an unprecedented impact on education. We are still conducting many of the same tasks, but new technologies are shifting our approach to those tasks. For sharing information and communicating with peers, we use such social media as Facebook, blogs, and Twitter. For creating, we use Flash, Flikr, and Mashups. We conduct meetings using webinars. We search using Google. We research with Wiki, and the list just goes on until we realize our students have even created environments in *Second Life* to support social learning networks in an imaginative futuristic setting.

Our Students Have Changed

Our students are growing up in a digital age that is changing rapidly. Very rapidly. These students are different because of that fact. The research on cultural migration teaches us that those born in a new culture learn the language easily and resist using the old.

John Palfry and Urs Gasser explain in *Born Digital: Understanding the First Generation of Digital Natives* that the children in our schools today are digital natives – born into a new culture. Those of us who are

digital immigrants, coming later in life into this new world, have two choices. We can choose to adapt, accepting that we do not know this world as well as our children and look to them to help us learn. Or, we can be inflexible immigrants, focusing on how good things used to be. If we are to reach our children and help them learn, we must adapt, we must face the fact that our students are no longer the people our educational system was designed to teach.

There is evidence that an increasing number of students today are different from the generations that preceded them. They learn differently, they are motivated differently, and they are not inclined to respond enthusiastically to a 'business-as-usual' approach to learning. In a July 5, 2009 essay published in the Sunday edition of the *Honolulu Advertiser* entitled "Students Need Education for the Real World," Commission Chair Robert Witt noted that our students are learning all the time, in what they call 'real time,' using resources that many older people are uncomfortable and/or unfamiliar with: podcasting, blogging, social learning networks, video games, virtual worlds, Skype, mobile media such as cell phones—students nowadays process information and communicate with one another 24/7 with advanced technological platforms that are inexpensive and provide worldwide access."

The issue is not about the technology itself, but about the *new mindset* of students. They are connected, mobile, social, instantaneous, and entertainment-oriented. They have redefined expertise as collective knowledge not based on age and often composed of small, cumulative contributions (think Wikipedia). For them, knowledge is open, collaborative, accessible, often from the bottom up, and frequently presented in multimedia. For older generations, knowledge is individually controlled, owned, comes from the top down (experts), and generally is presented in text-based form.

Those of us raised in a different era want to release information slowly and only after it has been vetted by experts; today's digital natives want to receive information quickly and from multiple sources. Older people want to do things step-by-step, one thing at a time; younger people want to multi-task and use parallel processing. Digital immigrants want independent work with a focus on the individual student; digital natives want to use simultaneous networks and collaborate. We want learning to be serious; they want learning to be fun. (Milliron)

We think information should be accessed in a linear and sequential fashion; they prefer random access. Text is our primary mechanism for disseminating information and assessing knowledge; they prefer visuals, sound, and multimedia. We rely on curriculum guides and tests and focus on deferred rewards (it will help you later); they want "just-in-time" learning that is relevant and useful and provides instant rewards. We see schools as the place to learn; they see the world as the place to learn. *Independent schools today reflect our preferences and world-view, not theirs*.

Perhaps it is time for us to rethink our models and our assumptions about school and about teaching and learning. What should future learning environments look like? How should we organize time to learn? What types of relationships and communities will nurture our students? What tools do they need? The schools based on industrial and agrarian models that have existed for centuries may not be the schools that we need for tomorrow. What might we imagine as a different model? And how might the accreditation process serve to mobilize schools to create a new model or models?

Exploration, Discovery, and Experimentation in Schools of the Future

Our schools can continue to educate students for a world they don't live in using teaching strategies they cannot comprehend, or we might embark on designing "Schools of the Future" by re-thinking the very way we conceive of "the purpose and experience of schooling and what we expect our high school graduates to know and be able to do." (Wagner)

At the 2008 NAIS Annual Conference in New York City, we learned from Daniel Pink that "the era of 'left brain' dominance, and the Information Age it engendered, is giving way to a new world in which 'right brain' qualities — inventiveness, empathy, meaning — predominate." At that same conference, the NAIS Schools of the Future initiative put on display "classrooms of the future," and everyone heard from Sir Ken Robinson about the necessity of teaching in such a way that we nurture the inventiveness and curiosity of our students.

Using a "business-as-usual" approach to school improvement, relying on our current accreditation protocols, we might "slouch" toward the future (Yeats) blending old with new pedagogy, or we might catalyze transformation in our schools. As Christopher Dede notes from his perspective at the Harvard Graduate School of Education, "You can't just sprinkle 21st century skills on the 20th century doughnut. It requires a fundamental re-conception of what swe're doing."

Similarly, in *Disrupting Class*, Harvard's Clayton Christensen defines the new "best practice" for our schools as "educational disruption," occurring "when new tools, processes, or ideas cause pressure on traditional school organizational practice to change." Areas ripe for "disruption," according to Christensen, include instructional practice, curriculum, student learning, assessment, structures like traditional school schedules, infrastructure such as building design, and more.

Momentum Exists and Models are Available

There is a growing body of evidence that early adopters with the independent school community are embracing innovation and discovery as their primary strategy for school improvement.

The Commission on Accreditation has developed this *Guide* for the early adopters in independent schools and associations. It includes a compendium of projects and programs already underway that convincingly make the case for us. *Noteworthy Projects, Programs, and Schools, with Unifying Themes* can serve as a useful resource as it provides both a roadmap for the design of successful projects as a first step as well as blueprints for school-wide implementation of 21st century skills.

The "Annotated Bibliography" contains the sources and literature that provided the key elements of this conversation. The six major headings may be useful in providing insights into how to think about "schools of the future."

- Our Changing World
- Leading and Managing Change
- 21st Century Skills and Capacities
- Curricular and Pedagogical Resources
- Teaching and Learning in the Digital Age
- Measuring 21st Century Skills

Each of the above categories represents a body of research that can guide schools in examining their programs and practice.

Essential Capacities for the 21st Century*

*These "Essential Capacities for the 21st Century" were distilled by the Committee on Schools of the Future from current literature.

1. Analytical and Creative Thinking and Problem-solving

- Identify, manage, and address complex problems
- Detect bias and distinguish between reliable and unsound information
- Control information overload
- Formulate meaningful questions
- Analyze and create ideas and knowledge
- Use trial and error; devise and test solutions to problems
- Imagine alternatives
- Develop cross-disciplinary knowledge and perspectives
- Engage in sustained reasoning
- Synthesize and adapt
- Solve new problems that don't have rule-based solutions
- Use knowledge and creativity to solve complex "real-world" problems

2. Complex Communication —Oral and Written

- Understand and express ideas in two or more languages
- Communicate clearly to diverse audiences
- Listen attentively
- Speak effectively
- Write clearly and concisely—for a variety of audiences
- Explain information and compellingly persuade others of its implications

3. Leadership and Teamwork

- Initiate new ideas
- Lead through influence
- Build trust, resolve conflicts, and provide support for others
- Facilitate group discussions, forge consensus, and negotiate outcomes
- Teach, coach, and counsel others
- Enlist help
- Collaborate sensitively and productively with people of varied backgrounds
- Coordinate tasks, manage groups, and delegate responsibilities
- Implement decisions and meet goals
- Share the credit

4. Digital and Quantitative Literacy

- Understand, use, and apply digital technologies
- Create digital knowledge and media
- Use multimedia resources to communicate ideas effectively in a variety of formats
- Master and use higher-level mathematics
- Understand traditional and emerging topics in math, science, and technology—environmental sciences, robotics, fractals, cellular automata, nanotechnology, and biotechnology

5. Global Perspective

- Develop open-mindedness, particularly regarding the values and traditions of others

- Study and understand non-western history, politics, religion, and culture
- Develop facility with one or more international language
- Use technology to connect with people and events globally
- Develop social and intellectual skills to navigate effectively across cultures
- Use 21st century skills to understand and address global issues
- Learn from, and work collaboratively with, individuals from diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue
- Leverage social and cultural differences to create new ideas and achieve success

6. Adaptability, Initiative, and Risk-Taking

- Develop flexibility, agility, and adaptability
- Bring a sense of courage to unfamiliar situations
- Explore and experiment
- Work effectively in a climate of ambiguity and changing priorities
- View failure as an opportunity to learn, and acknowledge that innovation involves small successes and frequent mistakes
- Cultivate an independence of spirit to explore new roles, ideas, and strategies
- Develop entrepreneurial literacy
- Use creativity and innovation to produce things that are unique and that have value and meaning

7. Integrity and Ethical Decision-Making

- Sustain an empathetic and compassionate outlook
- Foster integrity, honesty, fairness, and respect
- Exhibit moral courage in confronting unjust situations
- Act responsibly, with the interests and well-being of the larger community in mind
- Develop a fundamental understanding of emerging ethical issues and dilemmas regarding new media and technologies
- Make reasoned and ethical decisions in response to complex problems

Projects, Programs, and Schools with Unifying Themes

In a *Time Magazine* article published in 2006 on the deep disconnect between what American schools are teaching and what students will need to thrive in our era, author Claudia Wallis joked about what would happen if Rip Van Winkle awoke today after 100 years in a deep sleep. Rip would stumble out of bed into a world he cannot recognize: people everywhere talking into small devices hooked to their ears; young people sitting on sofas moving only their fingers to manipulate life-size action figures on electronic screens; workers seated in cubicles collaborating in real time with colleagues thousands of miles or even continents away; elderly individuals vigorously running marathon races thanks to artificial devices planted in their chests, hips, and knees; offices, airports, hospitals, and shopping malls—every place Rip goes confuses him. Then he walks into a schoolroom and, at last, recognizes where he is! The only thing that has changed is the color of the chalkboards.

During Rip's long snooze, every aspect of life experienced exponential change while schools largely remained static. Yet had Rip awakened near one of a growing number of schools that are retooling for the modern era, he would have been equally amazed at the transformation in education: fifth graders using thermographic cameras to detect and plot heat loss on their campus, in the community at large, and in their own homes, and then offering solutions for energy conservation; French students learning the imperfect and past perfect verb tenses by using Facebook, videoconferencing with people in France, and applying modern forensic tools to solve a "murder mystery"; six teenagers from Egypt, Malaysia, the United States, and The Netherlands forming a team and collaborating on-line across four continents and multiple time zones to create an award-winning website to educate their peers about the SARS virus; and classrooms where students are active questioners rather than passive listeners. Rip might again be baffled by what he sees, but at least he would recognize congruence between the strange new world he has entered and the education that strives to prepare young people for that world.

These pockets of educational innovation and creativity should serve as beacons, guiding and inspiring others to ride the tsunami of change toward innovation and transformation of our schools. We have a responsibility to assure that the children of this century will not leave our schools only to arrive on the threshold of adulthood feeling like Rip Van Winkle, dazed, and lacking the tools and experience to engage fully and successfully in the new world before them.

Goals and Intent

The Commission on Accreditation seeks to ensure that the graduates of independent schools will be prepared for college, work, and citizenship with the knowledge and capacities necessary to lead productive and purposeful lives in an uncertain and

ever-changing future. Working from the perspective of accreditation, the commission approaches school improvement by proposing questions and offering information to inspire reflection, innovation, and planning within individual schools.

The intention is not to provide a formulaic approach to the challenges of teaching and learning in our times but rather to encourage exploration, innovation, and transformation within each school in a manner that is consistent with the school's mission and the needs of its students.

As schools and educators, we are walking this path together. Experimentation and communication of the results of those endeavors, successful or not, will support all schools in the adaptive and transformative processes necessary to deliver a world class education for students in independent schools. To that end, the commission provides schools with helpful resources that can serve as a guide for implementing the "Essential Capacities for the 21st Century."

The following projects and programs are intended as illustrative blueprints for similar projects or, better yet, as a springboard for additional creative and innovative ideas.

Projects and Programs

NAIS Teachers of the Future

http://www.nais.org/about/index.cfm?ItemNumber=150570

With funding from the E.E. Ford Foundation, NAIS established the NAIS Teachers of the Future program whereby NAIS selects and supports a cadre of innovative teacher-leaders currently working in member schools. These individuals will help NAIS develop a new online community for independent school teachers.

The program provides valuable networking opportunities for teachers who wish to connect with others to mine ideas and to solve problems encountered in the process of infusing 21st century skills into an established curriculum.

Throughout the year, each selected teacher is asked to lead an NAIS online educational discussion forum and create a demonstration teaching unit video (three to 10 minutes in length) to be posted on NAIS's online independent school community and *TeacherTube*. The program provides recognition and leadership opportunities for selected teachers while spurring discussion about innovation in teaching and learning.

Schools of the Future

A Learning Community Focused on Transforming Schools in Hawaii

http://futureschools.ning.com

One of the most progressive independent school associations in the nation, the Hawaii Association of Independent Schools received grant money from the Hawaii Community Foundation to transform Hawaii's independent schools into schools of the future. This document contains myriad innovative and exciting project proposals from an array of schools. The various projects could serve both as an idea-generator and as a blueprint for project design and implementation.

The website is a treasure trove of information and ideas, including a chat forum, videos, and notes from professional development conferences.

Stories of Excellence

Case Studies of Exemplary Teaching and Learning with Technology

http://admin.nais.org/files/PDFS/NAIS_excellence_final2.pdf

NAIS's 21st Century Curriculum/Technology Task Force collected 20 case studies as outstanding examples of technology, teaching, and learning. The projects span a wide range of curricular areas and grade levels.

According to Jenifer Fox, former head of Purnell School (NJ), in her introduction to *Stories of Excellence*, "These stories should encourage independent school teachers and administrators to get online and begin to discover in earnest the plethora of creative, project-centered, collaborative curricular initiatives taking place all over the world. Once you do that, you will see that the stories in this report are not simply models; they represent imperatives for student success."

Each vignette describes the project in detail, including the resources and equipment required and furnishes the contact information of the lead teacher for anyone who desires further elaboration. Although the impetus for "The Excellence Challenge" was a focus on innovative use of digital technologies in the classroom, the projects serve as vivid examples of implementation of "The Essential Capacities" within the traditional academic curriculum.

21st Century Skills

Learning for Life in Our Times (DVD)

The 2009 book, *21st Century Skills*, by Bernie Trilling and Charles Fadel comes with a DVD featuring nine video segments on various projects and schools. Each segment highlights a different aspect of the challenge: 21st century assessment, school-wide infusion of 21st century skills, project design, and the Project Learning Institute, a professional development program for teachers seeking to develop the skills necessary to design and implement project-based learning.

Schools

While there are undoubtedly many noteworthy schools that are "walking the schools of the future talk," the following schools were identified for two reasons: first, each school incorporates the Essential Capacities throughout the entire school program; and second, each school tackled the challenge of innovation in a different way.

The schools include two public magnet schools, a public charter school, three independent schools, and two international schools. High Tech High and Seattle Academy for the Arts and Sciences were founded with missions that encompass the concepts of a 21st century education.

Brimmer and May transformed a long-standing traditional program. Prospect Sierra, in the hands of a dynamic and visionary head of school, is building upon the foundation laid by forward-thinking founders. Morton Middle School, Benson High School, and the Riverstone School adopted outside programs to fast track institutional change with a unifying concept to assure consistency across the curriculum. And the International School of Brussels built upon its firmly established and highly respected International Baccalaureate Program to infuse 21st century capacities, focusing especially upon digital technologies.

Transforming a Traditional Independent School

Brimmer and May School, Chestnut Hill, Massachusetts

www.brimmerandmay.org

Over one hundred years old, Brimmer and May School is a coeducational, college preparatory day school for over 400 students in pre-kindergarten through grade 12. Anne Reenstierna has served as head of school since 1985.

Fueled by a desire to recapture in high school students the same enthusiasm and love of learning that she observed in younger children, Reenstierna embarked on a journey to transform Brimmer and May from a traditional school with a classical curriculum to a progressive school with a global curriculum teaching 21st century skills.

Dr. Theodore Sizer, then dean of the Graduate School of Education at Brown University, inspired Reenstierna. A founder of the Coalition of Essential Schools (***www.essentialschools.org***), and a strong proponent of systemic school reform, Dr. Sizer and his associates proposed a set of Common Principles designed to engage students more fully in their own learning. The principles include teaching students to use their minds well, emphasizing depth of material over breadth; personalizing teaching and learning; inspiring students to learn how to learn; incorporating public demonstrations of mastery of learning; providing dedicated professional development and teacher planning time; and the modeling of values of trust, decency, fairness, and generosity.

Reenstierna writes, "While these seem like rather simple, common sense ideas for educators to implement, at my school in 1985, they were radical and required a great deal of change in the way teachers thought about their jobs and in the way parents viewed education."

From Reenstierna's perspective, a number of factors contributed to successful transformation of the school. First, she credits an entrepreneurial, risk-taking board chair who supported her desire to move the school in a new direction. Next, she had the good fortune to hire some young teachers trained by Sizer. The enthusiasm and excitement that these teachers created in the classrooms proved contagious; soon other teachers and parents were on board.

At that point, Reenstierna made exactly the right decision, taking a step that is too often ignored by visionaries and entrepreneurs: Over the next several years, she and her associate head of school, Judy Guild, worked relentlessly to provide the time, resources, and professional development required to turn a promising start into a dynamic, sustainable, and ever-improving school.

The curriculum features a global focus that balances traditional academic subjects and rigor with innovative practices, experiential learning, and project-based learning. The products of these endeavors are featured during an "Exhibition Week" that follows a traditional week of formal exams. Students work both independently and collaboratively on research assignments that require them to think critically and write with clarity, to synthesize information from various disciplines, and to share their ideas in public forums. AP classes are taught, but the offerings are carefully selected, with close attention to whether the tests will allow in-depth teaching as opposed to broad, superficial coverage of content.

There are those who believe that mission precedes action. In fact, as the story of Brimmer and May demonstrates, occasionally, action precedes mission. The school's current statements of mission, philosophy, and core principles that emerged as the result of the hard work and success of the initiative now permeate everything the school does and read like a primer of 21st century education.

Starting from Scratch

High Tech High, San Diego, CA

www.hightechhigh.org

A teacher recently said, "If all schools could start over and create the quintessential school of the future, that school would probably look like High Tech High." The goal from the outset was to create a place where, when one first enters the space, it is impossible to distinguish whether it is a technical school or a college prep school.

Founded in 2000 as a single charter high school by a coalition of San Diego business leaders and educators, the flagship, High Tech High (HTH), serves 490 students in grades nine through 12. The consortium now consists of five high schools, three middle schools, and one elementary school. The program is multidisciplinary, project-based, and incorporates the latest digital technologies. Each year, the school hosts visits from more than 2,000 educators, architects, and school planners from around the world who come to see a highly successful model school in action.

According to Rob Riordan, "Emperor of Rigor" and a founder of the school, "There are three axioms of public education in this country: separate students from each other based on perceived academic ability; separate minds from hands; and separate schools from the world beyond. We seek to integrate students, integrate technical and academic disciplines, and connect students with the community."

Admission is determined by lottery, and once admitted, students are not tracked according to ability. Teams of students and teachers work collaboratively to solve problems and create projects that integrate material across disciplines. The school's website provides examples of student projects.

Assessment includes presentations of learning before panels of faculty and peers. Although students sit for and do well on all of the traditional tests such as SATs, the school measures its success in terms of whether students are prepared to go to college, and whether once in college, they stay there. To date, 100 percent matriculate to college and 88 percent of HTH alumni have graduated from college or are still attending.

"Transparency" is the key word for the school. All walls are glass; no one can hide. The physical openness is reflected in relationships, student-to-student, teacher-to-teacher, and most important, teacher-to-student. There is collaboration across all disciplines.

Faculty development is an ongoing feature of the school and includes eight days of intensive work for all teachers in August before the opening of school, with an additional five days for teachers new to the school. Teachers must arrive at school at least one hour early to prepare for the day and /or to collaborate with colleagues. Almost every teacher is involved in the adult learning programs of the school as a mentor, a mentee, a graduate student, or a presenter in the HTH institutes and residencies. In 2004, the state approved HTH to certify its own teachers in partnership with the University of San Diego. Then in 2007, HTH received state approval to open the HTH Graduate School of Education offering Masters' programs in Teacher Leadership and School Leadership.

Integrating Tradition and Innovation

The International School of Brussels

www.isb.be

The International School of Brussels (ISB) was founded in 1951 and for much of its history, it has been considered among the foremost international schools in Europe. At the present time, it serves about 1,400 students from nursery through high school at its beautiful site on the outskirts of Brussels, where the landscaped campus borders a lake and a wooded preserve.

ISB has a strong reputation for stability and for being a school that has been capably governed and well led over a substantial period of time. This reputation is more than justified in terms of some objective features, such as board continuity, head of school leadership, and enrollment trends. Indeed, in the competitive educational market in Brussels, the school has shown considerable resilience and consistency over time.

The school's guiding principles include a mission statement that highlights inclusion as a key element. The mission statement is supported by another key concept named

"Our Enduring Goals." These are: *Everyone Included! Everyone Challenged! Everyone Successful!*

The school's 'common ground curriculum' is based around thematic learning. At every grade level and in all subjects, teachers collaborate on the development of Units of Learning that explore an aspect of the theme, and in which standards are embedded. This structure of themes, subjects, units and standards provides students with a curricular framework that is flexible enough for an international school but structured enough to ensure that children learn the basics. At the secondary level, students may select the International Baccalaureate diploma, the Advanced Placement diploma, or the ISB diploma.

ISB provides a technology-rich learning environment through a comprehensive approach called Teaching and Learning with Technology. Every child, from ages two and a half to 19, is provided with access to age-appropriate technologies. Technology, used as a tool for learning rather than a subject in itself, is fully integrated into the curriculum. Every ISB student, from grade three through six has access to a "Tablet PC." These student tablets reside in the classroom for daily use and are charged overnight. Personal tablets are provided to students in grades seven through 12 for use in school and at home. Key components of the program include:

- Appropriate technology use is an essential component of optimal learning environments
- Technology creates new teaching and learning opportunities that improve student understanding
- Technology encourages fundamentally different forms of interaction between students, teachers, and the community. It contributes to a learner-centered, collaborative, engaging learning environment
- Technology provides the means for students to explain, interpret, and apply their knowledge
- Technology allows teachers to meet the diverse learning needs of students by adapting to individual goals and learning styles

Adopting an Outside Program as a Unifying Concept

Decision Education at Morton Middle School and Benson High School, Omaha, Nebraska, and the International Baccalaureate Program at Riverstone School, Boise, Idaho

www.decisioneducation.org
www.ops.org
www.riverstoneschool.org

The prospect of school transformation can be daunting, especially for large schools or for any school with a faculty or parent body resistant to change. These schools might want to consider adopting, as a first step, an outside program or model. Decision Education and the International Baccalaureate Program are two options that have worked successfully in a number of schools.

Morton Middle School and Benson High School in Omaha, Nebraska, serve approximately 700 students in grades six, seven and eight, and 1,500 students in grades nine through 12, respectively. The schools were seeking ways to become more rigorous, strengthen their curricula, and develop a magnet concept. The answer came in a partnership formed with The Decision Education Foundation (DEF).

Both schools implemented the Whole Institution Decision Education (WIDE) program developed by the DEF (***http://www.decisioneducation.org***) and taught in partnership with Stanford University. Decision education, also known as decision science, involves the integration of analytical and creative thinking and problem-solving skills through a defined model of decision-making that can be applied to any academic or personal problem or decision. DEF's mission is to bring to younger students the fundamentals of decision science, concepts and skills that are traditionally not encountered outside of graduate schools in the sciences, medicine, engineering, statistics, or business.

DEF provided intensive initial training followed by ongoing workshops and support for the faculty who then incorporated the concepts into the existing curriculum and designed projects to provide opportunities for integrating and applying skills.

Students at Morton in grades five through eight take a semester-long class each year focused on decision science and then put the concepts into practice in other subject areas. As ninth graders, Benson students take an introductory class in decision science. The concepts are then reinforced and applied throughout the curriculum for the next three years.

Both schools involve students in a number of research, project, and team-based opportunities with a heavy technology component. The projects often involve working with outside organizations to solve a community problem or dilemma. For example, a group of students researched the best use of vacant, city-owned property. The team generated several options based on community needs and priorities, explored possible constraints of budget and city codes, and assessed environmental impacts. Their recommendation, supported by research and analysis, was presented to the city fathers in a formal presentation.

A number of independent schools have also explored and/or have adopted decision education, most notably Haverford School in Haverford, PA, (***www.haverford.org***) as a means to develop in students mission goals to think critically and communicate effectively.

Dr. Nancy Golden, superintendant of schools in Springfield, Oregon, has implemented decision education in Thurston High School and is currently working with outside analysts to create appropriate assessment measures to determine the effectiveness of the program (***www.decisioneducation.org/making-a-difference/what-educators-are-saying-about-DEF***).

Another program that garners considerable interest from schools seeking to infuse 21st century capacities is the International Baccalaureate Organization (IBO) (***www.ibo.org***). A number of public and independent schools have adopted the IB program as it has considerable credibility with colleges, and the IB learner profile and mission statement translate into a set of learning outcomes for the 21st century. The schools that are considering becoming IB schools believe the program offers a set of ideals that can inspire, motivate, and focus the work of the school and the teachers, uniting them in a common purpose. The IB website offers video examples of the program in action, blogs, curricular materials, and other classroom resources.

Riverstone School in Boise, Idaho, chose to create an international school in the foothills of the Rocky Mountains (***www.riverstoneschool.org***). Riverstone opened its doors in 1997 as the Hidden Springs Community School in an area of the country unfamiliar with independent education. The initial population of just 57 students in kindergarten through eighth grade gradually grew to 316 students in K-12. In 2001, the school approached the IBO to begin the rigorous authorization process that would permit the school to offer the IB Diploma.

The impetus for adopting the IB program was two-fold; first, the school was seeking to distinguish itself clearly from other schools in a location where independent education is not widely known; next, the school wished to bring to the area proven methods of teaching and learning that produce innovation, independence, and community-minded students and graduates.

When Andrew Derry became head of school in 2008, he perceived Riverstone as a ship flying the flag of an international school but still needing a course setting. A veteran of a number of international schools from Europe to Southeast Asia, Derry was excited by the prospect of heading a young school with a "blank canvas" that afforded an opportunity to incorporate within the IB context the essential capacities students will need for the future.

He began with a focus on Collaborative Learning. For example, an eighth grade unit joins pairs of students from Riverstone with students from Bogota, Columbia, to study the interdependence of humanity and the environment using the wolf and the condor as metaphors. Teachers in the two countries collaborate through videoconferencing and use the IB framework to structure the project. Students must work together as a team across barriers of space, time, culture, and language to produce an outcome. The culmination involves a videoconference presentation to the families of the teams and requires conversing both in English and Spanish to present and explain the results of the project. To date, several grades, including pre-school, have defined collaborative projects with students in other parts of world.

Collaborative teaching and learning challenged teachers to develop new skills. Professional development includes IB program protocols but extends to sending teachers abroad to visit and work on-site with partner schools to develop the projects. Teachers also work in-house together to plan, structure, and debrief learning units.

Implementing Strategic Vision

Prospect Sierra School, El Cerrito, California

www.prospectsierra.org

Prospect Sierra School is a kindergarten through eighth grade independent, co-ed day school enrolling 450 students on two campuses in the San Francisco Bay area. The school strives to develop in students a passion for learning, to build strong academic and creative skills, and to cultivate values of compassion, fairness, respect, and individuality.

Guided by a bold and visionary strategic plan, the school seeks to become a regional leader in middle school education with well researched, progressive, and innovative approaches to teaching and learning. Head of school Katherine Dinh has engaged the entire faculty across disciplines, grades, and campuses in research and discussion around 21st century skills. The goal is to define for the school those skills, values, and attributes the faculty believes will allow their graduates to thrive in the future.

Dinh began the 21st century skills project in a faculty meeting where she invited interested teachers to apply for membership on a team that would ultimately lead the school-wide project. She provided a list of qualifications required for individual team members, a timeline and deadlines, and a list of questions applicants should address in their application letters (See Appendix B).

Beginning with a required reading list as well as several suggested selections (see Appendix B), the team will engage teachers throughout the school in discussions, then by the fall of 2010, present to faculty and staff a synthesis of those conversations in the form of a written document with the descriptions of the 21st century skills, values, and attributes the Prospect Sierra faculty and staff have identified as essential for their graduates.

During 2010-11, the team will continue to work with the faculty to develop a curriculum map of the 21st century program, connecting the list of skills, values, and attributes to current programs. The final product of the team's collaboration will be a list of ways in which graduates can demonstrate mastery of those skills and attributes.

Prospect Sierra's process for transformative change can serve as a blueprint for other schools seeking to inspire widespread faculty engagement in the design and implementation of a 21st century curriculum.

Living the Mission

Seattle Academy of Arts and Sciences (SAAS), Seattle, WA

www.seattleacademy.org

Seattle Academy of Arts and Sciences (SAAS) is an independent, college preparatory school serving students in grades six through 12. Founded in 1983 with 75 students, the school now has 620 students. The school's mission is to prepare students for college and life. The "and life" portion of the mission continuously drives the school to adapt its program and practices to provide learning opportunities that will prepare students for the future. Examples include the infusion of global perspectives throughout the curriculum, an ongoing commitment to attracting and retaining a diverse student body and faculty, and fearless exploration of the use of digital technologies in teaching and learning.

For small, under-resourced schools that feel overwhelmed by the challenges of delivering 21st century skills, Seattle Academy can provide a blueprint. At its founding, SAAS occupied only a few cramped and rundown classrooms in a perceived high crime, high violence urban neighborhood. Lacking facilities and resources, an intrepid and creative faculty "made necessity a virtue" and utilized city resources to expand the classrooms to incorporate surrounding libraries, laboratories, theaters, galleries, museums, and parks.

Project-based learning supplemented the lack of other materials. While in the early years, this approach was necessary for survival, today as a well-resourced institution, the school maintains established community/global partnerships and experiential practices to provide students with learning opportunities that include joint projects, service learning, cultural immersion programs, and internships.

In terms of program, the school offers a traditional, demanding college preparatory curriculum with extensive arts, athletic, and outdoor/global travel programs. Central to an SAAS education, and infusing all core programs, is a "Culture of Performance. " Joe Puggelli, head of school writes, "The culture of performance is based on a simple belief that learning is not necessarily thinking, but doing is thinking, because doing forces one to assess, adjust, and try again. Whether in a math class, a science class, or a history class; whether on stage or on the dance floor; whether on the field or on the court; whether in Zambia or Alaska, our students have to take the traditional skills that every school teaches and use these skills to do things."

In practice, most classes involve projects that require student teams to tackle a challenging problem or issue, utilizing cross-disciplinary skills and knowledge to arrive at a solution. Each project culminates in a public presentation and defense of the work. The culture of performance encourages the development of all 21st century skills, including the ability to analyze an issue, take a position on this issue, explain and defend the position clearly, both in writing and in oral presentation.

One of the first laptop schools in the nation, SAAS makes extensive use of digital technologies as teaching, learning, and creative tools, and to assure that students will be comfortable, effective, and productive with technology.

Like Brimmer and May and High Tech High, professional development is a keystone of Seattle Academy's philosophy; teachers new to the school are provided with an extensive orientation and ongoing mentoring. Faculty meetings are devoted nearly exclusively to faculty development. Annual departmental retreats provide planning and collaboration time, and stipends are available for summer work for individuals and faculty who choose to collaborate in project or curricular planning.

Unifying Themes

These innovative schools differ from one another in location, style, structure, organization, and resources. The individual evolution of each school demonstrates the range of approaches possible and the opportunity to innovate and try things that are appropriate for a particular school community. That said, eight commonalities exist among the schools that are successfully delivering a 21st century education. They are:

- The schools are academically demanding
- Project-based learning, as an integral part of the school's program, is woven throughout all grade levels and disciplines
- Classrooms extend beyond the school walls, actively engaging students in the world around them
- Digital technologies and a global perspective infuse all aspects of the curriculum
- Vibrant arts programs help promote creativity, self-expression, self-discipline, and flexibility
- The adults are actively engaged with one another and with the students in a process of continuous learning
- A culture of engagement and support invites participation, innovation, and a "growth mindset" on the part of teachers and students
- Transformational leadership challenges the status quo, draws out the issues, navigates through conflict, and mobilizes people and resources to do the adaptive work necessary to create and sustain effective change

Academically Demanding

A focus on the Essential Capacities need not entail a diminishment of academic integrity and scholarship, nor sound a death knell for core knowledge.

In order to think analytically and creatively, in order to communicate effectively, one has to have something worthwhile to think and communicate about. The best learning takes place when the Essential Capacities are taught within the context of a knowledge base and are practiced over time. Students in these noteworthy

schools still study advanced literature and chemistry, world languages, history, and calculus. The difference is that they must go beyond the traditional passive capstone of a written examination to active application of knowledge in a new situation.

Teachers reasonably ask, *"If we add these capacities to our teaching, what goes away?"* It is an important question, and every school, department, and division will need to examine three things: selection of content, use of time, and the ratio of knowledge acquisition to conceptual understanding as demonstrated through application.

The model schools emphasize depth over breadth, adopting in spirit the motto of the Singapore Schools, "Teach Less. Learn More." Like those who annually "purge" their closets of outdated, rarely worn garments, these schools systematically scour the curriculum to eliminate non-essential and redundant content. Although all of the schools have students who perform well on AP exams, most choose not to teach AP classes, or like Brimmer and May, selectively offer only those AP classes that are what Anne Reenstierna calls *"more than a mile wide and an inch deep."*

With less emphasis on the acquisition of factual knowledge, departments can focus on conceptual, or systems, thinking. For example, when asked how he scored so well on an AP biology exam without having taken an AP biology class, a young man reported that his teacher's emphasis on the Laws of Thermodynamics provided a basis for reasoning his way to correct answers.

Even with selective choice of content, teachers feel pressed for time. The model schools have examined use of the daily schedule and annual calendar, in some cases, questioning the traditional six- or seven- period day to arrive at schedule configurations that provide longer blocks of class time, or even extending the school year. In all cases, strategic re-visioning of co-curricular and extra-curricular programs provides additional vehicles for the delivery of 21st century skills.

Project-based Learning

Some schools, like High Tech High, have dispensed with departmental divisions; others, like Seattle Academy and Brimmer and May, maintain traditional departmental structures. But regardless of school structure, project-based learning becomes one of the most important educational delivery systems.

For some educators and parents, the concept of "projects" conjures up visions of "busy work" such as hastily drawn posters, or maps filled in with colored markers. As demonstrated by the model projects and programs above, effective projects involve most, if not all, of the following characteristics:

- A high level of learning challenge
- A focus on real and relevant problems or issues
- Collaboration within a team
- Integration of skills and knowledge across different disciplines

- Public presentation and defense of the final project before an audience of peers, faculty, or even outside experts in the field

The benefits of project-based learning extend beyond a deeper understanding of core curriculum concepts. During the course of project design, execution, presentation, and defense, students are utilizing most of the Essential Capacities. Successful projects incorporate analytical and creative thinking, problem-solving, collaboration and teamwork, leadership, complex communication, and digital skills.

Classrooms Extend Beyond the School Walls, Engaging Students in the World Around Them

As the growing presence of on-line schools attests, formal education is no longer bound or constrained by four walls. Rather than campuses somewhat isolated from the real world, the 21st century school embraces the challenges of an increasingly complex world and calls upon faculty and students to wrestle with and solve adaptive problems with immediate application to everyday life.

All of the schools cited make extensive use of the world around us. Depending on the age of the student population and the school's resources, students move beyond the classroom into the immediate school neighborhood, the broader community, or even across the globe.

Science projects often involve the gathering and analysis of data through field research. Service learning engages students in community projects ranging from cleaning parks, to working with homeless populations, to providing relief for victims of disaster. Partnerships with outside organizations offer opportunities to enrich the curriculum, whether by incorporating the latest advances in biotechnology, collaborating with local organizations to produce public works of art, or placing students in significant internships.

Technology provides the means for collaboration across barriers of time, age, and geography. In the award-winning SARS project cited earlier, six teenagers from four countries worked together for several months to research SARS and create a website designed to educate their peers about the virus. The group only met face-to-face at the awards ceremony. Such opportunities prepare students for the global interaction and changing nature of work that will define their futures.

Digital Technologies and a Global Perspective

Student engagement is the key to effective learning. With the advent of digital technologies, the ways in which students learn, communicate, interact, and create have changed. While some teachers might begrudgingly accept and adapt to technology as a learning tool, today's digital natives view technologies as a basic element of their environment. Research shows that appropriate use of technology can improve instructional practice and students' engagement in learning.

The noteworthy schools embrace technology and are intrepid explorers of its potential as a learning tool. However, these schools do not see technology as an end in itself, but rather as a means for either doing more effectively what they were already doing, or doing that which they could not have done before. In the words of Seattle Academy head Joe Puggelli, "We do not allow the technology tail to wag the academic dog."

When all students and teachers have access to full-time use of wireless technologies, an opportunity exists to reshape learning and instruction. For example, some high school teachers are uploading lectures to the web, thus freeing class time for more in-depth discussion and for projects. Conversely, other teachers hold some on-line discussions in the evening, finding that the online format inspires certain students to participate far more actively.

Hand in hand with digital literacy, a global perspective is a new basic skill for our times. Every issue of sustainability—environmental, economic, political, cultural, and organizational—depends on our ability to operate effectively in a global capacity. Model schools infuse a global perspective throughout the curriculum with studies of global cultures, international languages, and the inclusion of non-western literature and perspectives. In an extraordinary commitment to global education, Brimmer and May routinely sends teachers abroad to study first-hand the regions whose histories and cultures will be studied in the classroom. While most schools lack the resources for such an endeavor, all of the example schools seek ways to engage students globally, either through digital connectivity, or through travel and study in other countries.

Vibrant Arts Programs

At first glance, it seems surprising that the arts play such an integral role in schools of the future. But on second thought, it makes perfect sense.

Clearly, the arts promote creative thinking, teach flexibility and adaptability, and encourage risk-taking. The arts also develop self-expression and communication skills. Perhaps most important, at a time when students are developing a sense of personal identity, the arts provide a safe environment for students to "try-on" different identities and roles.

Public performance is the most terrifying thing most of us ever face. Perhaps for this reason, the intensity of the arts, especially the performing arts, fosters discipline, a work ethic, and the realization that practice trumps talent.

Similar to good athletic programs, well-managed arts programs focus on developing individual competence while simultaneously fostering an esprit de corps that aspires to the highest levels of teamwork.

Finally, these noteworthy schools support the investment in arts programs because the arts provide moments of beauty and fulfillment that relieve stress and fill young hearts with hope and joy.

Learning Communities

If we are to develop young people who are imaginative, curious, creative, flexible, and adaptable, who are team players with a moral compass, and who have what Stanford University Professor Carol Dweck calls "a growth mindset," then we must create adult learning cultures in our schools that model those qualities.

The most visible commonality among these schools is that they are learning communities. Of course, schools are by nature learning communities, but in the model schools, there is an ethic of continuous growth on the part of the adults as well as the students. Recognizing the dynamic nature of our world, the teachers collaborate in a process of ongoing reflection, education, and adaptation.

Teachers are the key to school transformation. When asked to describe "the teacher of the future," i.e., that individual who can deliver an education for our times, each head of school focused on the same qualities:

- Deep domain knowledge
- A commitment to ongoing professional development
- Significant career and life experience outside of education
- A greater interest in what is learned than in what is taught
- An ability to work as part of a team

Schools have always valued teachers who are deeply and broadly educated. Yet at a time when the knowledge base is changing so rapidly, especially in technical fields, deep domain knowledge is more than ever a prerequisite to effective teaching. A teacher must be able to keep abreast of complex developments in his or her field, sort through extensive bodies of information to select the foundational concepts and knowledge to teach, and adapt curriculum quickly and effectively to assure students are prepared for college and careers.

The example programs avoid the insularity that so often characterizes the teacher-culture of schools. Professional development is hard-wired into the schools' systems.

Most schools offer summer stipends or mini-grants to encourage teams to work together in the summer to research relevant topics, develop curriculum, and/or design shared projects or activities. Several schools provide release time for departmental retreats or for teams of teachers, often from different departments or divisions, to visit other schools or attend conferences together. Faculty meetings are used for presentation and discussion of what was gleaned from these opportunities, for sharing insights about a particularly successful or disastrous project, and for exploring new ideas together.

Increasingly, schools are hiring individuals with extensive career and life experience outside of education, incorporating into the faculty a mix of research scientists and engineers, software developers, published authors and professional artists, attorneys and retired military officers. These

individuals bring ideas for challenging and engaging projects because they understand how what they teach is applied in a real world setting. In turn, the schools recognize the responsibility to train and develop these new hires in the art and science of teaching. High Tech High, as noted above, received approval from the state of California in 2004 to certify its own teachers, and in 2007, the school received state approval to open the HTH Graduate School of Education offering Master's Programs in Teacher Leadership and School Leadership.

Active mentoring is a part of professional development. In some schools, nearly every teacher is a mentor, a mentee, or both. For example, an experienced department head may be a mentor to a new member of the department, but at the same time, be mentored by another teacher on some aspect of technology integration.

While content knowledge and pedagogical expertise are integral to effective teaching, model schools hire individuals who are more interested in the students they teach than the curriculum they teach, and whose interests lie more in what is learned than in what is taught. As Joe Puggelli said, "We seek teachers who want the students, not the teacher, to be the star of the classroom."

Teachers who thrive in the model schools enjoy working and collaborating with others on ideas and projects. High Tech High's Rob Riordan said, "Our teachers must play well with others. They are not the kinds of people who enter the classroom, shut the door, and keep the world at bay. They must be comfortable working with a team and being observed by peers."

The days are gone when an experienced teacher can simply pull an oft-used lesson plan out of the file cabinet. Noteworthy schools inspire teachers to remain current, to continuously reinvent teaching methods informed by research and changing times, and to work together in ways that challenge and fulfill one both personally and professionally.

A Culture of Engagement and Support

To create change in our schools, we must buck powerful forces of resistance at work in all dimensions of school culture from trustees, to school heads, to teachers and staff, and then to students.

In *A Failure of Nerve: Leadership in the Age of the Quick Fix*, Edwin Friedman notes that as the speed and extent of change increase, anxiety also increases, from the cellular level to the individual, to the family, to the school, and to society. Within this context of continuous change and chronic uncertainty, it is natural to yearn for and cling to the certainty of the status quo. Parents want for their children an education that resembles what they experienced; alumni want their alma maters to be the idyllic environments they remember nostalgically; and teachers, already bombarded on all sides with increasing demands and cynical about "yet another educational fad," are loathe to undertake one more challenge,

especially when it involves changing the core of how they teach. Students, overly scheduled and anxious about maintaining perfect transcripts, often lack a tolerance for assignments requiring trial and error approaches, sustained thought, and work.

The call to action by NAIS at its 2010 Annual Conference to "thessuperpowers: adapt, survive, and thrive" is more than a remedy for the current economic crisis. These few words describe a mindset that has the potential to transform both the adult and the student cultures in our schools.

Experts in the area of organizational change are unanimous about the depth of the challenge: changing the culture of any organization is a highly complex process, and the cultures of schools are especially resistant to change. That fact is precisely why Rip Van Winkle can recognize a schoolroom when everything else is beyond his ken.

Successful transformation of schools requires commitment-building and buy-in from those who must deliver the program day in and day out. Just as engagement is the key to effective learning, participation and engagement on the part of the teachers are the keys to effective implementation of a 21st century education.

In the noteworthy schools, school leadership defines the mission, vision, and broad strategic outlines. Administrators establish the communication channels required to develop what Joe Puggelli calls "Same-Paged-Ness" around the conceptual framework. But the teachers are active designers of the program, working collaboratively with one another and their students to achieve the mission. Riverstone school head Andrew Derry says, "At the very heart of this process, we want teachers to take ownership and leadership, just as we are asking students to do." Prospect Sierra head Katherine Dinh has designed an inclusive structure easily adaptable to any school for creating faculty leadership, momentum, and eventually full-scale buy-in.

Relationships are the key to any well-functioning organization. And, to a large extent, the nature and quality of relationships determine culture. Nowhere is that fact more evident than in schools. Because of the involvement of so many constituencies—students, faculty, parents, trustees, administrators, staff, alumni, donors, neighbors—who all have a strong, vested interest, school cultures are especially complex. Rob Riordan notes that how individuals and constituencies interact will determine whether or not a school can build a common culture of learning and questioning where one can comfortably articulate observations and analysis.

Without question, the most important relationship is that between student and teacher. ***The Hamilton Project***, funded by the Brookings Institution, studied the qualities effective teachers manifest and found that paper credentials, educational standards, high stakes testing, class size, etc., are only background noise compared to what really matters in the delivery of a

quality education: the crucial interactions between students and teachers.

The cultures and programs of noteworthy schools are designed to strengthen the relationship between student and teacher. This bond builds a foundation of trust, respect, and empowerment that encourages students to stretch themselves, break through self-imposed limitations, and develop the confidence and competencies they will need in their future lives.

Transformational Leadership

Transformative change begins with a vision. Sometimes, the vision is the inspiration of the leader, and sometimes, it is the result of brainstorming and conversations among colleagues. Not infrequently, the vision is inspired by an idea or set of ideals that the leader happens upon and can imagine translated into practice within his or her organization. And, once in a while, the vision comes about by chance—an event, experience, or set of experiences suggest a new philosophy or set of practices.

Writing in the *Harvard Business Review*, Ronald Heifetz notes that once a new vision for the future is at work in a school community, the challenge for the "change leader" is to mobilize people to do adaptive work.

The nature of leadership has changed, and the days are gone when a leader can dictate a new vision or program and expect everyone to fall in line. The contrast between leadership in the past and leadership today has been likened to the difference between a symphony orchestra and a jazz ensemble.

In the past, leaders operated in a manner characterized by a command-control structure, much like the conductor of a symphony orchestra: the conductor chooses previously composed music, determines how he or she wants the piece to be played, and conducts the musicians accordingly. The individual musicians play the prescribed music as directed.

But today, like a jazz ensemble, the groups are smaller; the starting point is a main theme, but the final piece is the product of improvisation and innovation by all of the players. The leader is not the only star on the stage, but moves to the background as each player has a moment in the spotlight to add his or her own creativity and inspiration to the development of the theme.

The essential work of the transformational leader is to create the theme and provide a work environment where the most inspired improvisation and thematic development can take place. But it is easier said than done. Every head of school must deal with an endless barrage of "stuff," including the traditional challenges of limited resources or the broken boiler, and the more modern challenges of highly anxious parents, ever-increasing expectations, and an explosion of new reporting and legal requirements.

Ronald Heifetz, a world class cello player and expert on leadership, notes that rather than protecting people from outside threats,

we should allow them "to feel the pinch of reality in order to stimulate them to adapt." In the same way that "dissonance" plays a role in the jazz ensemble's creative process, Heifetz recommends that "instead of orienting people to their current roles, leaders must disorient them so that new relationships can develop. Instead of quelling conflict, leaders have to draw the issues out. Instead of maintaining norms, leaders have to challenge "the way we do business."

The oft-used saying that managers do things right while leaders do the right things is applicable to school transformation. The leaders of the noteworthy schools broke through the fragmentation of the daily nitty-gritty to achieve clarity and focus regarding their schools' directions. For Brimmer and May, the theme was The Common Principles from the Coalition of Essential Schools, for Seattle Academy, the theme was the A Culture of Performance, and for Prospect Sierra, the theme was a laser focus on 21st century skills. Each of the model schools found a unifying principle or set of principles that constituted or encompassed a vision for the future.

Ultimate success depends on empowerment, collegiality, and participation. In each example, the heads of school achieved broad, active endorsement of the direction and inspired ongoing participation of teachers who act purposefully to implement and extend the vision.

Just as trust is the essential component in the relationship between students and teachers, trust is the most important link between school leaders and the faculty. The players don't always know where the development of a theme will lead them, but they trust one another enough to accept that when things don't work out as planned, together they can achieve a course correction. Or, if necessary, their leader will guide them back to home key. Conversely, if the leader is the one who has set too quick a tempo or too dissonant a theme, the trust level is such that others feel they can question and suggest other approaches. In short, we must create cultures that embrace missteps as readily as successes.

Heifetz would add that "adaptive work creates distress. Before putting people to work on challenges for which there are no ready solutions, a leader must realize that people can only learn so fast. Because a leader must strike a delicate balance between having people feel the need to change and having them feel overwhelmed by change, leadership is a razor's edge."

Conclusion

After his encounter with the modern world, perhaps old Rip Van Winkle chose to return to his comfortable pile of leaves under the log and go back to sleep. Certainly there are those who would recommend that schools should follow just such a course—embrace the status quo—and let the world roll over us. If we choose that course of action, one thing is certain: our students, who are

smarter than that and, based on graduation and college attendance statistics, already question the relevance of schools, will seek some more meaningful way to spend their youth. The choice is clear: become irrelevant and fade away, or embrace the complexities of our era and figure out how best to prepare our young people to take the reins of the future.

These noteworthy projects, programs, and schools have chosen to rise to the challenge. And, they share another commonality that is perhaps the most useful lesson of all: there is a refreshing humility about these schools. They revel in their successes, they laugh and pick themselves up after their failures, but win or lose, they keep on chugging, and they keep on learning.

A Guide to Becoming a School of the Future © 2010 National Association of Independent Schools

Appendices

APPENDIX A

Guiding Questions

Questions originally designed for the Independent School Association of the Southwest (ISAS) by Jonathan Martin, head of St. Gregory College Preparatory School (AZ), with Rhonda Durham, ISAS Executive Director, to stimulate discourse within your community about the changes we face in our world and the implications of those changes for education.

APPENDIX B

Sample process for implementing a 21st century curriculum from Katherine Dinh, head of Prospect Sierra School

APPENDIX C

Accreditation Implications: New Model Core Standard and New Criterion

APPENDIX A

Guiding Questions

Questions originally designed for the Independent School Association of the Southwest (ISAS) by Jonathan Martin, head of St. Gregory College Preparatory School (AZ), with Rhonda Durham, ISAS Executive Director, to stimulate discourse within your community about the changes we face in our world and the implications of those changes for education.

1. **21st Century Life:** How has the world changed and what are the implications for education?
2. **21st Century Skills:** Does the NAIS Commission on Accreditation Schools of the Future Committee's overview of 21st Century Capacities hit the mark? Does a new/renewed emphasis on skills necessitate a decreased emphasis on knowledge learning?
3. **21st Century Students:** How are students today the same as their predecessors and how are they different? How do we respond to the differences?
4. **21st Century Instruction:** How must it change, and how can we accomplish this? What do advances in brain research and the cognitive sciences teach us about the learning process that we did not know before? What are the implications for the classroom?
5. **21st Century Assessment:** Does traditional letter grading continue to be effective as a measurement and an incentive for what we want students to learn, or does 21st century learning require new-format assessments? If so, what assessment techniques are required for 21st century learning?
6. **21st Century Teachers:** What are the characteristics of a 21st century teacher? What are the implications for our hiring practices? How do we best facilitate our teachers' evolution to contemporary teaching and learning? What forms of professional development are called for?
7. **21st Century Curriculum:** Does 21st century learning demand a renewed attention to inquiry, relevance, and/or project/problem-based learning, or are these alternate approaches too problematic to adopt wide-scale? Can the curriculum balance the teaching of core academics and 21st century skills? If so, how?
8. **21st Century Learning Technology:** Does contemporary learning require a large or larger role for laptops and other digital tools in the classroom and what are the pros and cons of wired classrooms?

APPENDIX B

Prospect Sierra Project Design

To: All Faculty/Staff, Prospect Sierra School
From: Katherine Dinh, Head of School
RE: 21st Century Skills Project
Date: January 25, 2010

Thanks for your attention at the division meetings when I presented the proposal for us to engage in research and discussion around 21st C. skills. I anticipate rich dialogue across disciplines, grades, and campuses that will help Prospect Sierra define those skills, values, and attributes we believe will allow our graduates to thrive in the future. Since this was introduced, the project has taken on a little more structure (as outlined below), but the hope is that the team will still have plenty of room to be creative with this process and the product.

As we discussed, a team of individuals from both campuses will collaborate on this project; a limited budget has been set aside for this Strategic Plan initiative, to be distributed by the end of the 2010-2011 year.

By the fall of 2010, the team will present to the faculty and staff a synthesis of our discussions and *a written document with the descriptions of the 21st C skills, values, and attributes* the Prospect Sierra faculty/staff have identified as essential for our graduates.

In the 2010-2011 school year, the team will continue to work with the faculty in a series of facilitated discussions with a desired goal of coming up with a *curriculum map* of the 21st C program. The team will lead the faculty in taking the list of skills, values, and attributes, and make connections to our current programs. *A list of ways in which our graduates demonstrate mastery* of the skills/values/attributes will be the final product of the team's collaboration.

Potential applicants should consider the following requirements:

- A commitment to read research materials, including, but not limited to, the books that have been mentioned in previous presentations (see attached booklist)
- An ability to synthesize large amounts of information and to share the research with others
- Ability to lead and facilitate discussion
- A strong collaborative sense
- Initiative and organization — once the team is decided upon, it will be your task to come up with a work plan and detailed time line
- A willingness to complete the work independently, and outside of school time as necessary

Timeline and Deadlines:

February 5, 2010: Applications due, Friday, February 5, 2010

March 15, 2010: Work plan for the project to division heads and Katherine

by May 30, 2010: Summary presentations of each book in faculty meetings

Summer 2010: Develop with faculty the list of 21st C skills

August 25, 2010: Present summary and list of 21st C skills to faculty and staff

Fall 2010: Develop with faculty a curriculum map that integrates 21st C skills

Winter 2011: Develop with faculty demonstrations of mastery of 21st C skills

If you're interested in working on this, please turn in to me a short application letter by February 5. Applicants will be notified by February 12. The application letter should provide a short statement that explains your interest in doing this work, and the ways in which you believe you will add value to the team.

Questions you may want to address in your application are below.

1. Why are you interested in being a part of the 21st C Project Team?
2. What specific skills do you possess that you believe will help the research team meet the objectives?

Thanks in advance for your interest and for taking the time to turn in an application. I look forward to hearing from you. If you have any questions, please don't hesitate to contact me.

Sincerely,
Katherine

Prospect Sierra Reading List

Book List for 21st Century Skills Project
Prospect Sierra School

Required:

1. Daniel Pink: *A Whole New Mind*
2. Tony Wagner: *The Global Achievement Gap*
3. Howard Gardner: *Five Minds for the Future*
4. Clayton Christensen and Michael Horn: *Disrupting Class*
5. Bob Johansen: *Leaders Make the Future*

Suggested:

1. Sir Ken Robinson: *Out of Our Minds*
2. Daniel Pink: *Drive*
3. Malcolm Gladwell: *Outliers*
4. Dacher Keltner: *Born to Be Good*
5. Thomas Friedman: *The World is Flat*
6. Thomas Friedman: *Hot, Flat, and Crowded*
7. Greg Mortensen and David Oliver Relin: *Three Cups of Tea*
8. Atul Gawande: *Better*
9. Alfie Kohn: *Punished by Rewards*
10. Carol Dweck: *Mindsets*
11. Bernie Trilling and Charles Fadel: *21st Century Skills*

APPENDIX C

Implications for Accrediting Practices

New Commission on Accreditation Model Core Standard

The school demonstrates that its educational programs, institutional practices, and institutional culture are informed by relevant research regarding how students learn and the knowledge and capacities they will need to lead purposeful and constructive lives.

New Commission on Accreditation Criterion

The standards require a school to provide evidence of a thoughtful process, respectful of its mission, for the collection and use in school decision-making of data (both external and internal) about student learning.

BIBLIOGRAPHY

The Committee on Schools of the Future derived its list of "Essential Capacities for the 21st Century" from the sources cited in this bibliography. The committee hopes that the following resources will be useful to schools as they navigate the seas of change and seek to chart a course that will effectively prepare their students for the challenges of the future. Although most of the works cited overlap more than one category, the bibliography is organized thematically under the following classifications:

- **Our Changing World:** perspectives on global change, its impacts on nations, organizations and individuals, and the implications of those changes for education, learning communities, and school cultures;
- **Leading and Managing Change and Innovation:** resources for those leading organizations and communities during times of change, both planned and unplanned;
- **21st Century Skills and Capacities:** analysis of the kinds of skills and capacities individuals will need to survive and thrive in our changing world;
- **Curricular and Pedagogical Resources:** current research on learning and achievement; guidelines and resources for creating and delivering a 21st century education;

- **Teaching and Learning in the Digital Age:** insights into how emerging digital and media technologies are changing the ways children learn, communicate, and create, and how schools must adapt to remain relevant to the modern learner; and
- **Measuring 21st Century Skills:** new trends and thoughts on school accountability, including emergent models for institutional assessment, school improvement, and measurement of 21st century skills.

Our Changing World

Carroll, Thomas G. "If We Didn't Have the Schools We Have Today, Would We Create the Schools We Have Today?" *Contemporary Issues in Technology and Teacher Education* 1, no. 1 (2000): pp. 117–140.
http://www.citejournal.org/vol1/iss1/currentissues/general/article1.htm

The author, now head of the National Council on Teaching and the Future of America, argues that in spite of wanting to change our schools to be more relevant to the needs of today and the future, we continue to educate our teachers for industrial age schooling models.

Compton, Robert. *Two Million Minutes.* DVD. Directed by Chad Heeter. Indianapolis: Broken Pencil Productions. 2007.
http://www.2mminutes.com/

Conceived and funded by high-tech entrepreneur and venture capitalist Robert A. Compton, *Two Million Minutes* takes its title from the approximate length of time between the start of ninth grade to high school graduation. The film highlights the lifestyles, academic habits, and personal aspirations of six top-tier high school students from different parts of the world. The principals, one boy and girl each from India, China, and the American heartland of Indiana, reveal in forthright interviews with them and their parents and in short clips of their daily lives, their efforts and attitudes toward their college or university prospects and subsequent lives as adults. The viewer perceives significant differences in the six students' personal and cultural expectations, educational and study regimens, and non-academic experiences as they try to master enough math, science, literature, and history to succeed in an increasingly competitive world. *Two Million Minutes* has received considerable praise for its evocative "wake-up call" to Americans, especially educators, to reconsider the allocation of a typical young American's time among academic and non-academic tasks and activities. Is it optimal when compared to practices elsewhere in the world, especially China and India? Likewise, it has been criticized for an overly simplistic analysis of complex sets of circumstances. The film is highly worthwhile for anyone interested in education if for no other reason than the provocative issues it compels one to consider and, we may hope, fruitfully discuss with others.

Gardner, Howard, Margaret Weigel, and Carrie James. "Learning: Peering Backward and Looking Forward in the Digital Era." ***International Journal of Learning and Media*** **1, no. 1 (winter 2009): 1–18.**

Gardner and his colleagues at the Harvard Graduate School of Education review what learning has been in the past — "traditional learning" in all its variations from the "bush schools" of Paleolithic times to the "public schools" of the modern era — and what it is likely to become in the digital environments of future global society.

Hoffer, Eric. ***The Ordeal of Change*****. Titusville, NJ: Hopewell Publications, 2006.**

The first sentence of this reissued book reads, "It is my impression that no one really likes the new." This simple statement belies the power of the author's thinking and analysis as he explores the impact of change and modernization on individuals, institutions and societies, reflecting that when change comes too fast, those who grew up in very different times may actually regress. Although the book was originally published in 1963, Hoffer's thinking clearly influenced subsequent work by Friedman and others cited in this bibliography. The concepts and ideas are directly applicable to our current era, helping to explain some of the difficult dynamics, particularly in parent groups, that challenge teachers and school leaders, and some of the global movements that challenge our national leaders. Considered one of the best American thinkers and philosophers of the 20th century, Eric Hoffer died in 1983.

Rischard, J. F. ***High Noon: 20 Global Problems, 20 Years to Solve Them*****. New York: Perseus Book Groups, 2003.**

At the time of publication of this book, author Jean-Francois Rischard was the World Bank's vice-president for Europe. In *High Noon*, Rischard identifies the 20 most important and urgent global problems of the 21st century; argues that we lack the means to cope with the challenges to come in our congested, interconnected world because our ways of dealing with problems belong to the past; and sets an agenda for the future. Nobel prize-winning physicist Murray Gell-Man writes, "Rischard has supplied a much-needed call for careful thought and for action. We can now build on his extremely clear discussion of the major global issues facing the world today, and of the linkages among them, and of opportunities to do something about them." Teachers and schools seeking meaningful, real-world issues for their students to tackle should start here.

Witt, Robert M. "The Way Students Learn Has Changed," *HonoluluAdvertiser.com*, **March 1, 2009.**
http://the.honoluluadvertiser.com/article/2009/Mar/01/op/hawaii903010333.html

(see below)

Witt, Robert M. "Students Need EducationFor the Real World," *HonoluluAdvertiser.com*, **July 5, 2009.** ***http://the.honoluluadvertiser.com/article/2009/Jul/05/op/hawaii907050340.html***

Executive Director of the Hawaii Association of Independent Schools and Chair of the NAIS Commission on Accreditation, Robert Witt is a passionate and articulate spokesperson for the necessity of change, innovation, and adaptation in the field of education. The *Honolulu Advertiser* commentaries are part of a series of articles prepared by Voices of Educators, a nonprofit coalition composed of some of Hawaii's top educational experts, and designed in partnership with the *Honolulu Advertiser* to foster debate and public policy change within Hawaii's public education system. The articles cited provide a cogent and compelling case for change in the way we educate our young people if we truly hope to prepare them for life and success in the future.

Zakaria, Fareed. *The Post-American World*. New York: W.W. Norton and Co., 2008.

The editor of *Newsweek International* and the host of CNN's "Fareed Zakaria GPS," Fareed Zakaria has been praised consistently for the insight and depth of analysis he brings to world affairs. His latest book, *The Post-American World*, makes the case that today's major movement is "the rise of the rest." By this he means not that America is in decline but rather that everyone else is advancing. While Zakaria is unequivocal in his analysis that the United States will no longer dominate the global economy, orchestrate geopolitics, or overwhelm other cultures, the tone of the book is optimistic in a relentlessly intelligent and reasonable way. Zakaria's command of economics, politics, demographics, and education combine to weave a fascinating tapestry of future possibility, pinpointing the opportunities that lie ahead if America deploys its unique strengths to prosper while the rest of the world does as well.

Leading and Managing Change and Innovation

Christensen, Clayton, Michael B. Horn, and Curtis W. Johnson. *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*. New York: McGraw-Hill, 2008.

Hailed by *Business Week* as one of the "Best Books on Innovation, 2008," *Disrupting Class* advocates the use of technology to move education beyond standardization to customized learning and student-centric classrooms as central to our efforts to educate students capable of competing in a global economy. Inspired by recent studies in neuroscience and building on the concept of "disruptive innovation," a principle first introduced by Harvard Business Professor Christensen in "The Innovator's Dilemma," the authors provide provocative case studies, compelling scientific findings, and interesting insights on how to manage innovation. Perhaps a bit idealistic in scope and both

costly and difficult to implement, the directions advocated in the book nonetheless provide valuable insights into future potential directions and possibilities.

Collins, Jim. *Good to Great: Why Some Companies Make the Leap… and Others Don't.* New York: Harper Collins, Harper Business, 2001.

One of the best-selling books of all time, Good to Great seeks to answer questions about how good companies became great companies. Collins examines 11 companies over a 15-year period whose returns exceeded three-fold those of the stock markets for that period, identifies commonalities among those companies, and compares them to competitors in the same field who failed to achieve the same success. The result is a set of principles for organizational success. An accompanying "Monograph for the Social Sector" applies those same principles to the not-for-profit world. Good to Great critics attribute the book's success and popularity to the "Barnam Effect," i.e., that it has "something for everyone," providing a prescription that is vague and generic enough for broad appeal rather than delivering specific, new research. On the other hand, legions of CEOs, entrepreneurs, and leaders of not-for-profit organizations have found the book inspiring and motivating to the extent that many of Collins' concepts (e.g. "Face the brutal facts.") have entered the business vocabulary.

Collins, Jim. *How The Mighty Fall: And Why Some Companies Never Give In*. New York: Harper Collins, 2009.

Jim Collins's latest book on management focuses on how great organizations that seem on an inevitable success trajectory can stumble, and in some cases, even fall into oblivion. As Collins has said, every organization, no matter how great, is vulnerable to decline: "Whether you prevail or fail, endure or die, depends more on what you do to yourself than on what the world does to you." The author identifies five stages of decline, catalogues the behaviors that tend to show up in each phase, and contrasts how different companies have navigated through those periods either to success or failure. Critics have noted that *How the Mighty Fall* fails to have the same rigor of research that characterized *Good to Great*, with its carefully matched pairs of companies. Collins, however, quotes Tolstoy, "All happy families are alike; each unhappy family is unhappy in its own way." The phases of decline, as Collins describes them, certainly ring all-too-familiar bells in light of the recent economic downturn. An excellent reading assignment for not-for-profit boards of trustees as well as for corporate boards, the section on succession planning alone makes the book worth the price.

Evans, Robert. *The Human Side of School Change: Reform, Resistance, and the Real-Life Problems of Innovation*. San Francisco, Jossey-Bass, 1996.

Innovation, school reform, and institutional transformation are exciting discussion topics

but difficult to implement. As its title implies, Rob Evans's first book offers a thorough grounding in the realities of how people and school reform mix. His approach is deeply practical. He covers human behavior, organizational functioning, and common sources of resistance to school reform. He offers management strategies for solving problems, improving communication, and motivating staff. He makes the case for realistic expectations of how quickly reform can take place and how leaders will perform. He also suggests a conceptual framework for school improvement that involves understanding the process of change, educators as people, and the craft of leadership. Ultimately, *The Human Side of School Change* encourages cooperation between those who lead changes those who must implement it.

Friedman, Edwin. *A Failure of Nerve: Leadership in the Age of the Quick Fix*. New York: Church Publishing, 2007.

Especially engaging for leaders who want to think and move in new directions, *A Failure of Nerve* takes a close look at common emotional and intellectual fallacies and roadblocks that can cause problems when major change is taking place. Its author, Edwin Friedman, brings to bear his experience as a rabbi, family therapist, and organizational consultant. His understanding of the power of emotional process in institutions offers valuable perspectives for anyone in leadership, and especially for those in schools and social service organizations. In addition to providing paradigms for shifting thinking from "finding answers" to "changing the questions," the book offers invaluable guidelines for leading effectively in times of turbulence.

Gladwell, Malcolm. T*he Tipping Point: How Little Things Can Make A Big Difference.* New York: Little, Brown and Co., 2002.

"Tipping points" are "the levels at which momentum for change becomes unstoppable." In this best seller about the puzzling shifts that can lead to everything from a craze for Hush Puppy shoes to plummeting crime in New York City, Gladwell claims that ideas, products, messages, and behaviors spread in much the same way as viruses. He describes the three "agents of change:" "The Law of the Few," those whose participation are critical to the success of an endeavor; "The Stickiness Factor," the specific content of the message that makes its impact memorable; and "The Power of Context," the extent to which human behavior is sensitive to and strongly influenced by its environment. Gladwell's analysis as to why "tipping points" occur has been challenged by Duncan Watts, a network-theory sociologist at Columbia University, and by economist Steven Levitt, author of the book *Freakonomics*. Nevertheless, Gladwell's work provides serious food for thought to any individual or organization seeking to change or innovate.

McKinsey & Company. *How the World's Best Performing School Systems Come Out on Top.* [Chicago]: OECD Directorate for Education, 2007.

The report says that three factors appear to make the biggest difference: (1) attracting the most appropriate individuals to teaching; (2) giving them the needed professional development to become successful instructors; and (3) making certain that the system can provide the best possible teaching for every student.

Wheatley, Margaret J. *Leadership and the New Science: Discovering Order in a Chaotic World.* San Francisco: Berrett-Koehler Publishers, 2006.

This ground-breaking book uses new scientific theories to explore several issues organizations must grapple with, from order and structure to flexibility and innovation. The work uses breakthroughs in areas such as quantum physics, chaos theory, and biology to illuminate aspects of work and life. Although it was lauded as the No. 1 management book of 1992 when first published, the original work was criticized because the scientific concepts were difficult to understand and apply to a business context. This new edition is more accessible to lay readers thanks to more extensive explanations, an additional chapter on change, and strongly drawn links between the science and the issues face.

21st Century Skills and Capacities

Levy, Frank and Larry Murnane. *The New Division of Labor: How Computers Are Creating the Next Job Market*. Princeton: Princeton University Press, 2004

Levy and Murnane revisit the four questions that have been periodically asked since the advent of the computer: What kinds of work do humans do better than computers? What kinds of tasks do computers do better than humans? What well-paid work is left for people to do both now and in the future? How can people learn the skills to do this work? The book provides a compelling analysis of the ways digital technologies have changed the world of work and a cogent roadmap for the skills individuals will need to survive and thrive in the information age. The authors bundle these capacities under two umbrellas—expert thinking and complex communication—identify verbal, quantitative, and digital literacy as essential enabling skills, the gateway to developing the specific identified abilities required for success in the future.

Levy, Frank and Larry Murnane. *Teaching the New Basic Skills: Principles for Educating Children to Thrive in a Changing Economy*. New York: The Free Press, 1996.

This book's premise is that if tomorrow's adults are to earn at least a middle-class salary and succeed in the global economy, schools must teach today's students to master "the new basic skills." The authors divide them into "hard" skills, such as math

and reading; "soft" skills, including working in groups and making presentations; and, finally, the ability to use technology. To teach these skills, Levy and Murnane suggest, schools must retrain teachers using the same motivational techniques that corporations use with their managers. The book uses case studies to show how the application of five management principles can boost student achievement. Critics of "the new basic skills" argue that the skills are too basic (e.g., the ability to read at a ninth-grade level).

Partnership for 21st Century Skills. ***http://www.21stcenturyskills.org/***

Calling itself "the national organization that advocates for 21st century readiness for every student," the Partnership for 21st Century Skills aspires to place essential expertise at the center of American K-12 education by promoting collaboration among leaders in education, business, government, and local communities. The partnership was formed in 2002 through the efforts of the U.S. Department of Education, AOL Time Warner Foundation, Apple Computer, Microsoft Corporation, Dell Computer Corporation, the National Education Association, and others. Its website is a tremendous resource for school leaders and teachers who want to help students become effective workers, leaders, and citizens in the future.

Pink, Daniel. ***A Whole New Mind: Why Right-Brainers Will Rule The Future*****. New York: Penguin Group, 2006.**

An example of the management-book trend toward recognizing the value of creativity and innovation, *A Whole New Mind* offers a whole new view of what's required to succeed in business. The book postulates that the future belongs to those with "right-brain" qualities, including inventiveness, empathy, and the ability to uncover meaning. Referring to three prevailing trends that will influence business and economy—abundance, Asia, and automation—author Daniel Pink believes creativity will become the competitive edge that can differentiate commodities. He outlines the six essential senses that will determine future success. He also gives context by outlining four major "ages"—the Agricultural Age (farmers), the Industrial Age (factory workers), the Information Age (knowledge workers), and the Conceptual Age (creators and empathizers). This fourth stage is where Pink believes businesses and individuals must focus in order to be successful.

Robinson, Ken. ***Out of Our Minds: The Business Revolution, Creativity, and Education.*** **New York: John Wiley & Sons, 2001.**

This is a fascinating book that explores the reasons why the old ways of thinking about creativity are grossly inadequate for the challenges that lie ahead of us. Educators in particular will be keen to read Robinson's criticisms of how we teach, how we measure learning, and the inherent biases in the

global educational system that erode creativity and stifle those students who think differently than the system requires. He wastes few words in lamenting the traditional strategy to improve education by increasing standards and developing more tests to measure learning. He has deep confidence in the native intelligence and human capacity of children, and unabashedly promotes the latest research in neuro-developmental science that argues for new ways of thinking and learning. Although entertaining, the book is not pop psychology but is properly footnoted and research studies are cited throughout the text. The book is not for the weak of heart. It will jump-start whatever "alternative" educational initiatives one has in mind and threatens the traditional ways of thinking about improving education.

Trilling, Bernie and Charles Fadel. *21st Century Skills: Learning For Life In Our Times.* San Francisco: Jossey-Bass, 2009.

Bernie Trilling is the global director for the Oracle Foundation, serves as a board member of the Partnership for 21st Century Skills (P21), and was a director for the Technology in Education group at WestEd. Charles Fadel is global leader for education at Cisco Systems, and the Cisco board member of P21. Together they co-chair the Partnership's Standards, Assessment, and Professional Development committee. The book has received high praise for providing a clear explanation of what is meant by 21st century education and a practical framework for infusing these skills and capacities into curricula and classrooms. The book contains classroom vignettes, global examples, schoolwork samples, and perhaps of most interest, a DVD with mini-documentaries of innovative practices and specific projects that put theory into action.

University of Minnesota–Duluth. "Transferable Skills Survey"
http://www.d.umn.edu/kmc

The Knowledge Management Center (KMC) at the University of Minnesota published a transferable skills survey listing the skills prospective employers expect in job applicants and consider fundamental to success in the workplace. The instrument lists five broad skill areas that are divided into more specific skills. The KMC focuses on those skills it considers "transferable" as in a time of rapid change. Students will be best served by acquiring skills that can be applied across disciplines and to differing situations.

Wagner, Tony. *The Global Achievement Gap*. New York: Perseus Book Group, 2008.

Provocative, thoughtful, and inspirational, Tony Wagner's book explores the true global achievement gap—that is, the gap between what even our best schools are teaching and testing and what our students will need to know and do to survive in the new global economy. After talking to business leaders and sitting in on classes in top public schools, Wagner discerned a major difference between the qualities employers seek when hiring (such as the ability to think critically and creatively and communicate

effectively) and what schools encourage (including passive learning and lesson plans that teach to the test and emphasize memorization). The book identifies seven survival skills for college, careers, and citizenship in the 21st century. Educators, business leaders, and policymakers all cite *The Global Achievement* Gap as a "must read."

Walser, Nancy."Teaching 21st Century Skills." *Harvard Education Letter*, **September/ October 2008.**
http://www.hepg.org/hel/article/184

Walser's article summarizes the broad consensus emerging as the list of critical skills for the 21st Century, but then asks the critical question: "So, then, how are such skills to be taught and evaluated?" In Walser's analysis, the critical skills are those that will help the user of modern information technology make the most of such resources and the innovations succeeding them. The "rub" is how teachers, on a colossal scale, are going to be motivated, re-trained, and equipped to do something transformative and utterly different from what they are now *required* to do. Presently, the general legislative approach to modern pedagogy is to blend the old with the new. But Harvard Graduate School of Education Professor Christopher Dede regards this as flawed. He asserts, "You can't just sprinkle 21st Century skills on the 20th Century doughnut. It requires a fundamental reconception of what we are doing."

Curricular and Pedagogical Resources

Barron, Brigid et.al. *Powerful Learning: What We Know About Teaching for Understanding*. San Francisco: Jossey-Bass, 2008.

This book argues that schools have clung to educational philosophies and techniques from a century ago even though the rest of the world has radically changed in recent decades. In particular, educators have been surprisingly loyal to the teacher-and-textbook model, underpinned by lectures, discussion, and reading, in spite of complete transformations in almost every other sector of our society. However, this "dominant paradigm" is starting to shift. The authors note many examples of teachers, principals, and district administrators implementing new forms of project-based curricula and performance-based assessment.

Chapin, Dexter. *Master Teachers: Making a Difference on the Edge of Chaos.* Lanham, Md.: Rowman & Littlefield, 2009.

A veteran of 35 years in education in roles ranging from superintendent of schools, science department chair, and high school biology teacher, Dexter Chapin focuses on teachers and the dynamics of the classroom from about 20,000 feet, using the perspectives of Systems, Chaos, and Culture Theories. This book talks about who teaches and why, what the goals of teaching are and how to achieve them, and the role of teacher in the larger socio-cultural context.

Chapin maintains that the philosophy of education as a one-size-fits-all endeavor undercuts what teachers actually do, in all its complexity and depth. Recognized by NAIS as a 2009 "Teacher of the Future" for his innovative use of modeling programs in the science classroom, Chapin was also instrumental in designing the Washington State Standards and Guidelines on Environmental Sustainability.

Decision Education Foundation.
http://www.decisioneducation.org

Rooted in the conviction that better decisions lead to better lives, the Decision Education Foundation (DEF) has trained hundreds of educators and school leaders in Decision Quality (DQ) and continues to develop materials that are being adopted by schools nationwide. DEF's goal is to make the teaching of decision skills an integral part of educational programs so that every student understands the process that leads to decision quality. Participating teachers have reported improvements in critical thinking and problem-solving skills, increases in student achievement, improved classroom behavior and student collaboration, enriched classroom discussions, and increased creativity, which they associate with students' acquisition of decision skills. DEF founders — academic and business leaders from Stanford, MIT, and other leading universities — bring decades of experience in teaching decision science and applying this discipline to business, medicine, and engineering. Having witnessed the power of decision science firsthand, the founders recognized the potential to impact the world of education by adapting content typically first encountered at graduate school level to elementary and secondary schools.

Dweck, Carol. *Mindset: The New Psychology of Success*. New York: Random House, 2007.

For teachers facing students who should perform better, parents wishing their daughters would embrace math and science, and coaches and HR directors thinking their athletes and staffs could achieve more, Stanford University psychologist Carol Dweck offers this research-based advice: Encourage a "growth mindset" rather than a "fixed mindset." For decades, Dweck has studied intelligence, motivation, achievement, and success. Based on her findings, she believes that individuals do better when they're willing to risk initial failure by challenging themselves to grow their abilities. In contrast, people don't achieve as much by fixating on how smart they are and what they already do well while steering clear of tasks that may lead to mistakes.

Gladwell, Malcolm. *Outliers: The Story of Success*. New York: Little, Brown and Co., 2008.

Malcolm Gladwell, a British-born Canadian journalist, has been a staff writer for *The New Yorker* since 1996 and was one of Time magazine's 100 most influential people in 2005. Sometimes labeled "a pop sociologist," Gladwell mines academic studies for their surprising implications for

daily life. In *Outliers*, he asks why some people achieve more than others and concludes that the answer may go beyond intelligence and ambition to culture, class, family, and sometimes even birthplace and birth date. The true story of success is complex, according to Gladwell, and offers unexpected and provocative lessons in how to maximize human potential.

Hattie, John A. C. *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement.* London: Taylor & Francis, 2009.

Based on 15 years of research involving 83 million students, this ground-breaking work by Auckland University Professor John Hattie is the largest evidence-based study of how to actually improve learning in schools. The book systematically explores long-held assumptions about the variables that influence learning (including students and teachers themselves, home environment, school curricula, and teaching strategies); individually tests those assumptions variable by variable; and provides a "dashboard indicator" graph of the relative effect of each variable. Hattie then develops a model based on what he calls visible teaching and visible learning. A major conclusion: Both students and teachers do best when attention is paid to challenging them, setting clear goals for success, and devising learning strategies that build conceptual understanding. Hattie's analysis found overwhelmingly that the top variable was the quality of student-teacher interaction, along with giving regular and timely feedback, and fostering an atmosphere of trust.

International Baccalaureate Organization. "IB Learner Profile,"
http://www.ibo.org/programmes/profile/
(accessed October 16, 2008)

As the International Baccalaureate website says, "The IB's three programs for students aged 3 to 19 help develop the intellectual, personal, emotional, and social skills to live, learn, and work in a rapidly globalizing world"; the program's participants are 876,000 students at more than 3,000 schools in 139 countries. The IB's Learner Profile translates the organization's mission statement into a set of learning outcomes and a long-term vision of education—"a set of ideals that can inspire, motivate, and focus the work of schools and teachers, uniting them in a common purpose." In addition to providing the Learner Profile and learning outcomes, the IB website includes the organization's mission statement, strategy, opportunities for professional development, video examples of the program in action, blogs, curricular materials, and other classroom resources.

MIT Media Lab. *Lifelong Kindergarten*
http://llk.media.mit.edu/

This website and its related articles and resources have been developed over the past decade on the premise that all learning should be like it was in kindergarten: enjoyable, engaging, creative, and project-based.

National Research Center for the Gifted and Talented. "Research-Based Resources"
http://www.gifted.uconn.edu/nrcgt/resource.html

The National Research Center for the Gifted and Talented (NRC/GT), located at the University of Connecticut and working in collaboration with the University of Virginia, is conducting a study titled "What Works in Gifted Education: Excellence and Equity in Educating Gifted Students." The website offers curricular units in math and reading that incorporate ideas from a variety of gifted-and-talented models and emphasize conceptual thinking, real-world disciplinary inquiry, and problem-solving—skills universally recognized as key components of a 21st century education. The School-wide Enrichment Model (SEM) could be of particular interest to all schools and teachers. SEM's teaching methods are applicable to several content areas and settings and can lead to higher achievement among many types of students, including those of high ability who have learning disabilities or are prone to underperforming.

North Carolina Professional Teaching Standards Commission. "North Carolina Professional Teaching Standards"
http://www.ncptsc.org/mission.htm

Since 2007, the North Carolina Professional Teaching Standards Commission has been charged with bringing the state's Core Standards for the Teaching Profession into alignment with the Board of Education's new mission statement: *"Every public school student will graduate from high school globally competitive for work and postsecondary education and prepared for life in the 21st century."* The resulting document is a new vision of teaching that recognizes that today's world demands new teacher roles—both in the classroom and the school at large—and works within the standards' definition of "what teachers need to know and do to be able to teach students in the 21st century."

West Virginia Department of Education. "Content Standards and Objectives"
http://wvde.state.wv.us/policies/csos.html

The Committee on Schools of the Future explored a selection of state department of education websites in an effort to ascertain the priorities, content standards, strategies, and other resources used to assist educators in planning and delivering effective 21st century instruction. This West Virginia site was designed by teachers to assist colleagues. Information is easily accessible and includes, as a list on the website says, "21st century standards-based units; lesson plans; instructional guides; and project-based learning designs that model integration of content, learning skills and technology standards, research-based instructional strategies, differentiated instruction, and rich classroom assessments, including a culminating performance, product, or project with an accompanying rubric."

Wisconsin Department of Public Instruction. "Wisconsin Model Academic Standards"
http://dpi.wi.gov/standards/

On its website, the Wisconsin Department of Public Instruction says that its academic standards specify "what students should know and be able to do, what they might be asked to do to give evidence of standards, and how well they must perform." Links to the four core standards (English, mathematics, science, and social studies) provide separate web pages for the content and performance standard of each subject and each grade level. Other model academic standards are available for a wide range of instructional areas including foreign languages, the arts, environmental education, agricultural education, and personal financial literacy.

World Affairs Council. "Global Classroom"
http://www.world-affairs.org/classroom.htm

The Seattle-based World Affairs Council of America describes itself as "an association of 90 independent organizations in 39 states and the District of Columbia that work to engage and educate Americans on international affairs and foreign policy." The non-profit, non-partisan council has a reputation for quality programs including the Global Classroom, which exposes teachers and students to international citizens, ideas, and resources through training, speaker series, curriculum design, and youth programs. For those who attend the council's professional development training, up-to-date curricular units on a variety of global topics are available for download. The curricular units are often aligned with Washington state's Classroom Based Assessments (CBA), but teachers who are not using CBAs may also find useful lesson plans and resources in the packets.

Willingham, Daniel T. *Why Don't Students Like School?* San Francisco: Jossey-Bass, 2009.

Based on his study of the biological and cognitive basis of learning, cognitive scientist Dan Willingham has distilled his knowledge into a set of nine easily understood principles with direct application to the classroom. Each chapter is centered around a question: *How can I teach students the skills they need when standardized tests require only fact?; Is drilling worth it?; Why is it so hard for students to understand abstract ideas?"* He explains the importance of story, emotion, memory, context, and knowledge in building lasting learning experiences. His work echoes that of Gallagher in *Rapt* and Dweck in *Mindset*, although his primary focus is the importance of factual learning and practice as a precursor to higher order conceptual learning. Willingham directly challenges Howard Gardner's theory of multiple intelligences and contends "'Learning styles' don't exist."

Teaching and Learning in the Digital Age

Catalyze Learning International
http://www.markmilliron.com/

Mark Milliron is a speaker, author, and consultant whose areas of expertise include leadership development, trends of the future, learning strategies, and what he calls "the human side of technology change." Milliron has presented to school heads in a number of commission member associations as well as universities, K-12 schools, corporations, and government agencies across the country and around the world. Knowledgeable in current and emerging technologies and how they can be applied effectively in the classroom, Milliron makes engaging, interactive presentations can inspire and encourage teachers and leaders who are hesitant to move into a 21st century learning environment.

Edutopia. The Digital Generation Report.
http://www.edutopia.org/digital-generation/

Although today's kids are "born into a media-rich, networked world of infinite possibilities," as Edutopia.org notes, "their digital lifestyle is about more than just cool gadgets; it's about engagement, self-directed learning, creativity, and empowerment." Edutopia's Digital Generation Project features videos and stories about these engaged, self-directed young people to help educators and parents see just how differently the kids learn, communicate, and socialize. The Digital Generation Project was produced with support from the John D. and Catherine T. MacArthur Foundation. (***http://digitallearning.macfound.org/site/c.enJLKQNlFiG/b.2029199/k.94AC/Latest_News.htm***)

Gallagher, Winifred. *Rapt.* New York: Penguin Press, 2009.

Acclaimed behavioral science writer Winifred Gallagher proposes "a grand unifying theory of psychology: Your life is the sum of what you focus on." In an age of twittering, emailing, sound bites, and multi-tasking, Gallagher discusses the psychology and neuroscience of attention and makes the connection between attention and achievement. She provides exercises that can improve the focusing power of young children and offers techniques to help adults discipline their attention. At a time when educators are seeking ways to move students beyond superficial processing of information to more complex thinking and problem-solving, Gallagher's suggestions about how to resist the lure of technological innovations that can diminish our students' ability to concentrate are most welcome.

Ito, Mizuko, HeartherHorst, et al. *Living and Learning with New Media: Summary of Findings from the Digital Youth Project.* The John D. and Catherine T. MacArthur Foundation Reports on Digital Media and Learning, November 2008.

In a summary of the results of a three-year ethnographic study of young people and new media, this white paper addresses two major research questions: "How are

new media be¬ing integrated into youth practices and agendas?" and "How do these practices change the dynamics of youth-adult negotiations over literacy, learning, and authoritative knowledge?"

Landmarks for Schools.
http://landmark-project.com/

David Warlick's mission is to educate students and teachers about the potential of digital tools in the classroom. Operator of the Landmark Project, "a consulting and innovation firm" based in Raleigh, North Carolina, Warlick is a leader in the field of educational technology; a former classroom teacher, district administrator, and staff consultant with the North Carolina State Department of Public Instruction; the author of four books on teaching, learning, and schooling in the 21st century; and a frequent presenter at workshops around the world. His website, Landmarks for Schools, provides free teacher tools, including blogs connecting teachers within and across curricular disciplines; the "citation machine," designed to help students and professional researchers properly credit the sources used; and an education podcast network.

New Media Consortium and EDUCAUSE Learning Initiative. *The Horizon Report: 2008 Edition*. Austin: New Media Consortium, 2008.

Each year the New Media Consortium (NMC) and the EDUCAUSE Learning Initiative (ELI) collaborate on *The Horizon Report*, which "describes six areas of emerging technology that will have significant impact on higher education over the next one to five years." The report's value goes beyond simply talking about technology to cover how to use technology to enhance teaching, learning, and the creative arts. The annual findings are based on the work of an international advisory board that reviews relevant research and interviews; discusses both existing and potential applications; and "ultimately ranks more than 100 candidate technologies for their potential relevance to teaching, learning, and creative expression." The reports are free at ***http://www.nmc.org/publications/2010-horizon-report***.

Palfrey, John and Urs Gasser. *Born Digital: Understanding the First Generation of Digital Natives.* New York: Perseus Book Group, 2008.

Born Digital explores the world of "Digital Natives," those children who were born into and raised in a digital world, and provides an extensive look into how digital technologies impact the way these children interact, communicate, learn, and create. The authors duly note the potential problems of life online; the growth of digital dossiers on individuals; the loss of privacy; epidemic illegal file-sharing; issues of intellectual property rights; information overload; and the potential psychological and even physical harm from Internet predators and cyberbullies. However, the overwhelming message is one of encouragement to fully realize the extraordinary opportunities inherent in digital technologies for creativity, learning, entrepreneurship, and innovation. If we as a society are to fully realize the upside of the digital world, avoid the pitfalls, and educate our children in ways that are

relevant to their new ways of studying, working, writing, and interacting, then digital literacy is a fundamental skill for the future. Well-designed media literacy programs hold the best hope for maximizing the potential of current and emerging technologies while helping young people manage the negative impacts.

Tapscott, Don. *Grown Up Digital: How the Net Generation is Changing Your World.* McGraw-Hill, 2008.

Don Tapscott writes about a $4.5 million study of some 8,000 members of the "Net Generation," born between 1978 and 1994. The resulting book is as entertaining as it is convincing and optimistic. As a review of the book in *The Economist* notes, Tapscott

finds that the problem is not with the digital generation but rather "with the befuddled baby-boomers, who once sang along with Bob Dylan that 'something is happening here, but you don't know what it is,' and now find that they are clueless about the revolutionary changes taking place among the young."

Measuring 21st Century Skills

Burnett, Jefferson and Amada Torres. "Student Outcomes that Measure the School's Value-added," February 19, 2009. National Association of Independent Schools.
http://www.nais.org/sustainable/article.cfm?ItemNumber=151607

Recognizing the growing importance of accountability, NAIS has reviewed assessment tools that track a range of measures, from student engagement to college matriculation to parent perceptions. Assuming that the primary purpose of these measurements is institutional assessment and improvement, schools can choose the tools that best fits their respective missions and communities. The list is divided into five categories: school data, standardized tests, international tests, value-added tests, and student surveys.

Partnership for 21st Century Skills.
http://www.p21.org

The P21 website offers a range of resources on the critical systems necessary to ensure student mastery of 21st century skills, including guidelines for assessment. A white paper, "21st Century Skills Assessment," discusses summative and formative forms of assessment, the specific characteristics of each in a 21st century skills context, how states can create and implement assessment to promote 21st century skills in their classrooms, and a helpful bibliography for further research on the topic.

Silva, Elena. "Measuring Skills for the 21st Century." *Education Sector Reports,* November, 2008.
http://www.educationsector.org/publications/measuring-skills-21st-century

This report, arguably the most comprehensive to date on the challenge of assessing 21st century skills, identifies

promising emerging models of assessment, and explores perspectives both on the types of teachers required to deliver the curriculum of the future and reliability factors inherent in performance-based assessment. The endnotes to the paper offer an intriguing set of resources for further exploration. The report's publisher is Education Sector, a nonprofit, nonpartisan think tank; its website says it "challenges conventional thinking in education policy" and "is committed to achieving measurable impact in education, both by improving existing reform initiatives and by developing new, innovative solutions to our nation's most pressing education problems." Author Elena Silva oversees the think tank's teacher quality work.

Watertown Public Schools. "Measuring 21st Century Skills. "Emerging and Current Assessments."

This PowerPoint presentation identifies emerging assessments that the Watertown district would like to use to assess acquisition of 21st century skills, including ETS iSkills and Metiri Dimensions21 with the associated web links to each. The presentation includes references and/or links to current assessment mechanisms, a selection of teacher developed rubrics, and identifies a list of 21st century skills for which we lack defined assessment mechanisms.

About the NAIS Commission on Accreditation

The NAIS Commission on Accreditation comprises representatives from 19 NAIS state, regional, and international associations that accredit independent schools, two representatives from the NAIS board, and two "at-large" members.

As described in its mission statement,

The NAIS Commission on Accreditation is an international authority on independent school accreditation. The primary purpose of the Commission is to provide quality assurance and accountability for the accreditation programs of its state, regional, and international member associations.

The Commission establishes and maintains criteria for effective accreditation and conducts formal evaluations of member association accreditation programs.

The Commission also examines and assesses the evolving educational environment, and it acts as a catalyst in partnership with associations in navigating significant change, developing innovative practices, and promoting transformative leadership in the field of accreditation.

Ultimately, the work of the commission strengthens independent school education and supports the ongoing improvement of individual schools, while enhancing the learning experiences of their students.

The commission is seeking new approaches to independent school accreditation that will sustain peer-driven accountability and an improvement program that will serve well as a catalyst to create "Schools of the Future."

For more information, please visit ***www.nais.org/go/CoA***

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