

21ST CENTURY SKILLS

LEARNING
FOR LIFE IN
OUR TIMES

BERNIE TRILLING
& CHARLES FADEL

Praise for *21st Century Skills*

"The authors have done nothing less than provide a bold framework for designing a 21st century approach to education, an approach aimed at preparing all of our children to successfully meet the challenges of this brave, new world."

—**PAUL REVILLE**, Secretary of Education, Commonwealth of Massachusetts

"Trilling and Fadel describe in very readable, practical terms how to infuse 21st century skills from standards all the way into the classroom. The DVD is full of wonderful 'ah-ha' moments to illustrate the possibilities. A terrific traveling companion for educators, parents, and business and government decision makers concerned about the future of our kids."

—**PAIGE JOHNSON**, 2009 Chair of the Partnership for 21st Century Skills;
Global K-12 Manager, Intel Corporation

"It's about time that we have such an accessible and wise book about the 21st century skills that so many companies, policymakers, and educators are talking about. Trilling and Fadel distill insights from diverse communities of reflective inquiry on what redesigns of learning environments are needed to foster these skills, and provide pathfinding tools for the exciting expeditions into the future of learning."

—**ROY PEA**, Stanford University, professor of education and the learning sciences

"Trilling and Fadel lay out a comprehensive understanding of what is meant by 21st century skills. Read this book with a notepad—you'll be jotting down ideas for how to use the information in your school district. A must-read for superintendents, curriculum directors, and teachers."

—**ANNE L. BRYANT**, executive director, National School Boards Association


"Trilling and Fadel take the 21st century skills debate beyond rhetoric, providing a substantive, compelling, and engaging argument for the skills and competencies that our children need to succeed in a Knowledge Age economy. The skills they describe are the essential lifeblood of a productive, engaged, and intelligent citizenry—this book is a must-read for skeptics and enthusiasts alike!"

—**MARGARET HONEY**, president and CEO, New York Hall of Science

EDUCATION

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Bernie Trilling and Charles Fadel

Co-chairs of the Standards, Assessment and
Professional Development Committee of the



PARTNERSHIP FOR
21ST CENTURY SKILLS



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PRAISE FOR
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—Paige Johnson, 2009 Chair of the Partnership for 21st Century Skills;
Global K–12 Manager, Intel Corporation

“Bernie Trilling and Charles Fadel have written a book that is truly visionary, providing sound insight into education in the 21st century. Their book provides solid, practical advice for educators, policymakers, business leaders, and others interested in improving America’s position in the global economy. I recommend it to anyone interested in maximizing classroom effectiveness in this digital age.”

—Dr. Steven L. Paine, West Virginia Superintendent of Schools

“A must-read for anyone interested in the ability of the United States to compete in a global economy. Educators, policymakers, business leaders, parents, and students will benefit from the comprehensive information on 21st century skills.”

—Mary Ann Wolf, executive director, State Educational Technology Directors Association (SETDA)

“Working, living, and learning in the 21st century will require an expanded set of skills, competencies, and flexibilities. We must prepare for a continuous learning and reskilling process throughout our lives and careers. This is a powerful exploration of what we collectively face as we live the future. A must-read!”

—Elliott Masie, CEO and chair, The Learning Consortium

“Trilling and Fadel take the 21st century skills debate beyond rhetoric, providing a substantive, compelling, and engaging argument for the skills and competencies that our children need to succeed in a Knowledge Age economy. The skills they describe are the essential lifeblood of a productive, engaged, and intelligent citizenry—this book is a must-read for skeptics and enthusiasts alike!”

—Margaret Honey, president and CEO, New York Hall of Science

"Hooray to Bernie Trilling and Charles Fadel for demystifying 21st century skills. This book makes clear why education must change: to help prepare students to meet complex challenges, fulfill their civic responsibilities, and live fulfilling lives. Full of crisp descriptions, *21st Century Skills* persuasively shows why policymakers and educators should run—not walk—to implement 21st century learning designs."

—John Wilson, executive director, National Education Association

"With *21st Century Skills*, Bernie Trilling and Charles Fadel have given us a global 'search and replace' for outdated educational thinking. Replace 'scope and sequence' with the '21st Century Learning Framework,' the P21 rainbow."

—Milton Chen, executive director, The George Lucas Educational Foundation

"Charles and Bernie's book cuts to the core challenge facing our country—is our education system preparing our children with the skills to succeed in a 'flat' 21st century world? Much more than a treatise on what is wrong with education, they provide a compelling vision for education as it should be and a road map for getting where we need to go."

—Keith R. Krueger, CEO, Consortium for School Networking (CoSN)

"This book presents an innovative, comprehensive strategy for evolving education to meet the needs of 21st century society."

—Chris Dede, Harvard School of Education

"The authors have done nothing less than provide a bold framework for designing a 21st century approach to education, an approach aimed at preparing all of our children to successfully meet the challenges of this brave, new world."

—Paul Reville, Secretary of Education, Commonwealth of Massachusetts

"It's about time that we have such an accessible and wise book about the 21st century skills that so many companies, policymakers, and educators are talking about."

—Roy Pea, Stanford University, professor of education and the learning sciences

"Trilling and Fadel lay out a comprehensive understanding of what is meant by 21st century skills. Read this book with a notepad—you'll be jotting down ideas for how to use the information in your school district. A must-read for superintendents, curriculum directors, and teachers."

—Anne L. Bryant, executive director, National School Boards Association

"*21st Century Skills* is full of interesting examples illustrating both what work will look like in the years ahead and how thoughtful educators are preparing children to thrive in tomorrow's workplaces. The richness of the examples reflects the authors' extensive knowledge of how work is changing in the nation's most innovative firms and their deep involvement in the efforts to improve America's schools."

—Richard J. Murnane, Thompson Professor of Education and Society,
Harvard Graduate School of Education

"Trilling and Fadel have captured powerful insight into critical 21st century learning skills. Life goes on and so must learning—this book is a must for anyone interested in the future of education."

—Allan Weis, Former IBM vice president, founder of ThinkQuest and
Advanced Network & Services

"*21st Century Skills* provides specific recommendations for how we can—indeed *must*—change the curriculum, teaching, assessment, use of technology, and the organization of our schools to better prepare students to be productive, creative citizens and workers in the global society and economy of the 21st century."

—Robert B. Kozma, Ph.D., emeritus director, Center for Technology in
Learning, SRI International

"Bernie and Charles have presented a well-researched and futuristic framework for changing how we teach and learn for the 21st century. It will be up to all of us to accept this challenge and move our country and world into and beyond the 21st century."

—Kathy Hurley, senior vice president, Pearson K–12 Solutions and Pearson
Foundation; Incoming Chair, The Partnership for 21st Century Skills

"This is a well-written and referenced road map for the complicated and interconnected collection of skills, knowledge, and attitudes that are essential for citizens to master in our increasingly complex and rapidly changing technological society."

—John E. Abele, Founding Chairman of the Board, Boston Scientific

"Inspirational and motivational, this book is a practical guide to implementing and understanding 21st century skills. Every teacher and parent should read it so they can prepare their children and their students to solve the problems of tomorrow, today."

—Dr. Barbara "Bobbi" Kurshan, executive director, Curriki

“After all the talk about organizing education, this book leads us back to what education is for. *21st Century Skills* is a comprehensive and elegant survey of our changing world, the skills it requires, and how those skills can be taught and learned. Here is a blueprint for 21st century schooling.”

—Michael Stevenson, vice president, Global Education, Cisco

“This book presents an excellent case and road map for K–12 schools, for balancing content knowledge delivery with the development of necessary skills for success. It can serve as a valuable guide for parents, educators, and policymakers.”

—Ioannis Miaoulis, Ph.D., president and director, Museum of Science, Boston

“For anyone who cares about the future of our children and their success in a global economy, *21st Century Skills* is required reading.”

—Gerald Chertavian, chairman, Massachusetts Board of Elementary and Secondary Education's 21st Century Skills Task Force; founder and CEO, YearUp

“Bernie Trilling and Charles Fadel have been two of the essential intellects behind the growth of the 21st century skills movement. We have been asked for years to provide an in-depth treatment of the 21st century skills framework. Here it is.”

—Ken Kay, executive director, Partnership for 21st Century Skills; CEO, e-Luminate Group

“Struggling to understand or explain the imperative for 21st century skills in our schools? Begin here.”

—Julie A. Walker, executive director, American Association of School Librarians (AASL)

“*21st Century Skills: Learning for Life in Our Times* is a necessary and readable articulation of the reality of 21st century skills in educating today's generation of learners. Kudos to the authors for achieving clarity on this timely topic.”

—Karen Cator, past chair, Partnership for 21st Century Skills

“Bernie Trilling and Charles Fadel have moved beyond the hype and buzz surrounding ‘21st century skills’ to provide an insightful and commonsense guide to rethink learning and teaching in a world that urgently demands innovative, inventive, self-motivated and self-directed, creative problem solvers to confront increasingly complex global problems.”

—Paul Reynolds, CEO, FableVision

To the 22nd century learners who will surely wonder what all the fuss was about and why it was so hard for everyone in the 21st century to do the obvious!

—Bernie and Charles

To Jennifer, Samara, Jeremy, Oriana, and my extended family and friends who keep my learning real, honest, relevant, deep, and everlasting.

And to the parents and teachers of the world's children who shape our future each day.

May that future be bright, caring, green, and full of hope.

—Bernie

To my daughter, Nathalie, with all my forever-unconditional love.

To my mother, Aline, for teaching me open-mindedness through example.

To Ray Stata, founder of Analog Devices Inc., who in 1990 kindled my passion for education through his presentation "Accelerating the Rate of Learning."

And to the little girl in Santo Domingo, whose eyes will forever remind me that "a mind is a terrible thing to waste."

May you, and the many millions like you, find the dignity, happiness, and serenity you deserve, through the transformational power of education.

—Charles

| THE AUTHORS |

The co-authors of this book, Bernie Trilling and Charles Fadel, have long been completing each other's sentences at Board meetings of the Partnership for 21st Century Skills (P21). Since 2005 they have co-chaired P21's Standards, Assessment and Professional Development Committee, which produced P21's breakthrough 21st century learning framework. This framework, plus the committee's white papers, skills maps, policy guides, and "Route 21" Web repository of 21st century learning examples and resources (<http://www.21stcenturyskills.org/route21>) are all helping to guide the transformative work of education across the world.

In their global education roles, Bernie and Charles have spoken to thousands of educators and met with hundreds of education leaders on the move to a 21st century approach to learning.

Though they both have been deeply involved in the development of innovative technologies to reshape learning, Bernie and Charles share a deep conviction that the most important learning tools are our minds, our hearts, and our hands, all working together.

Bernie Trilling is global director for the Oracle Education Foundation, directing the development of education strategies, partnerships, and services for the Foundation's ThinkQuest program. He represents the Foundation as a board member of the Partnership for 21st Century Skills.

Bernie has worked on a number of pioneering educational products and services, and is an active member of a variety of organizations dedicated to bringing 21st century learning methods to students and teachers across the globe. Prior to joining the Oracle Education Foundation, Bernie was director of the Technology in Education group at WestEd, a U.S. national educational laboratory, where he led a team of educational technologists in integrating technology into both the instructional and administrative realms of education. He has also served in a variety of roles in both education and industry, including executive producer for instruction at Hewlett-Packard Company, where he helped lead a state-of-the-art, global interactive distance learning network.

As an instructional designer and educator, Bernie has held a variety of professional educational roles in settings ranging from preschool to corporate training. He has written dozens of articles for educational journals and magazines, as well as chapters for educational books, and is a featured speaker at numerous educational conferences.

Bernie attended Stanford University where he studied environmental science and education. He also took some time off from Stanford to help organize the very first Earth Day in Washington, D.C.

Taking Mark Twain's advice of "never letting school interfere with one's education," Bernie has been a lifelong, self-propelled learner, spending much of his career furthering the kinds of learning experiences that he has found most engaging, collaborative, real-world, and powerful, working to make these experiences available to learners of all ages.

Charles Fadel is Global Lead for Education at Cisco Systems, and the Cisco board member on the Partnership for 21st Century Skills, of which Cisco was a founding member. He has engaged with a wide variety of education ministries or boards including Massachusetts, France, Chile, Brazil, and the Dominican Republic, and has worked on education projects in more than thirty countries and states.

Charles has authored articles in publications such as *Technology & Learning*, *New Media Consortium*, *eSchool News*, *Education Week*, *University Business*, *EETimes*, and others. He has presented at numerous education conferences, including the Consortium for School Networking (COSN), the National School Boards Association (NSBA), the National Center for Technology Innovation (NCTI), and the Masie Center's learning conferences.

He is presently advising two e-Learning start-up companies, two nonprofit organizations, and several professional organizations including the State Educational Technology Directors Association (SETDA), and several committees of the Organization for Economic Co-operation and Development (OECD). Charles has recently served on the Massachusetts Governor's Readiness Project as well as its 21st Century Skills task force. He served on the advisory board of AIMS Multimedia (now part of Discovery Channel). He is also incubating a nonprofit organization addressing the convergence of 21st Century Skills and Science, Technology, Engineering, and Math (STEM).

Charles is driven by education as the preeminent mechanism to profoundly improve the human condition, and embraces the promise of technology to progressively enable the mass personalization

of learning. He also believes that interdisciplinarity is an oft-neglected mechanism of scientific and humanistic progress, and a key growth engine in the future.

Charles has been awarded five patents on video, content, and communication technologies. He holds a bachelor of science in electronics with a course concentration in quantum and solid-state physics with a minor in neuroscience, and a master's of business administration in international marketing. An avid reader, he has autodidactically learned cognitive sciences disciplines (evolutionary psychology, comparative linguistics, and others), and enjoys the lessons of classical history.

| PROLOGUE |

THE SEARCH FOR INNOVATIVE LEARNING

Our visitors were a distinguished delegation of education officials from the Chinese Ministry of Education. They had come to see with their own eyes the U.S. schools they had heard were innovating in teaching and learning.

At the Napa New Tech High School in Northern California, a school famous for its project approach to learning, we were visiting a classroom that looked like a hybrid between a corporate conference room and a miniature media production studio. We were talking, with the help of an interpreter, to a group of students and their teacher, all very proud to show off their recent project work.

As part of their project, the students had recently implemented some clever conservation methods that were saving the school hundreds of dollars each month in utility costs. They also helped protect a nearby watershed from erosion by planting carefully chosen native shrubs and trees.

One of the Chinese delegates, Mr. Zheng, appeared increasingly excited the more he saw and heard. By the time we gathered to recap the day's experiences, he just couldn't wait to speak any longer.

He held up the school's curriculum guide and asked, in English, "Where in here do you teach creativity and innovation? I want to know how you teach this! We need our students to learn how to do this!"

The school's curriculum director, Paul, took a deep breath, collected his thoughts, smiled, and answered slowly, "I have some not-so-good news . . . and some good news.

"The not-so-good news is . . . it isn't in the curriculum guide.

"It's more in the air we breathe—or maybe the water we drink; the history of our country—Thomas Edison, Henry Ford, Benjamin Franklin; it's in our business culture, our entrepreneurs, our willingness to try new ideas; the tinkering and inventing in our garages, the challenge of tackling tough problems and the excitement of creating something new; in being rewarded for our new ideas, taking risks, failing, and trying again.

"In a strange way, our U.S. schools have been becoming more like your schools in China, focused on learning what will be tested in the big exams that determine so much of a student's future. Our school is trying to keep the spirit of innovation and invention alive in the projects we do. We believe these skills are essential to being successful in our new global economy and in helping to solve the problems we all face together."

Mr. Zheng, thinking deeply about all that it would take for today's Chinese traditional school culture to embrace a more innovative approach to learning, asked hopefully, "And what is the good news?"

Paul chuckled.

"Well, the good news is that with the right opportunity and support, we have seen that our students can learn to be more creative and innovative. But it takes good teachers to create the right balance—between learning the facts and principles, and coming up with new solutions to problems and creative answers to questions they really care about."